

Control components

DEFENSE - MARINE



MAFELEC

Creating control and signalling solutions for harsh environments.



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MAFELEC is a specialist in the design of control and signalling components intended to operate in the cold, heat, projections of liquids, dust, shock, vibration, ...



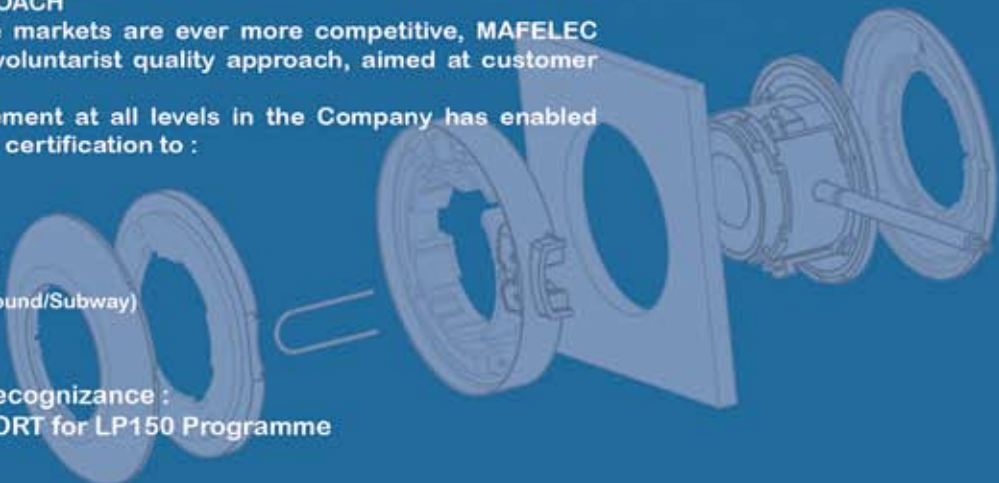
THE QUALITY APPROACH

In a context where markets are ever more competitive, MAFELEC stands out for its voluntarist quality approach, aimed at customer satisfaction.

Very active involvement at all levels in the Company has enabled MAFELEC to obtain certification to :

ISO 9001 V2000
OTIS Q+ (Otis lifts)
AQAP 110 (Defence)
RQPF (Paris Underground/Subway)
ISO 14001

Other know-how recognizance :
ALSTOM TRANSPORT for LP150 Programme



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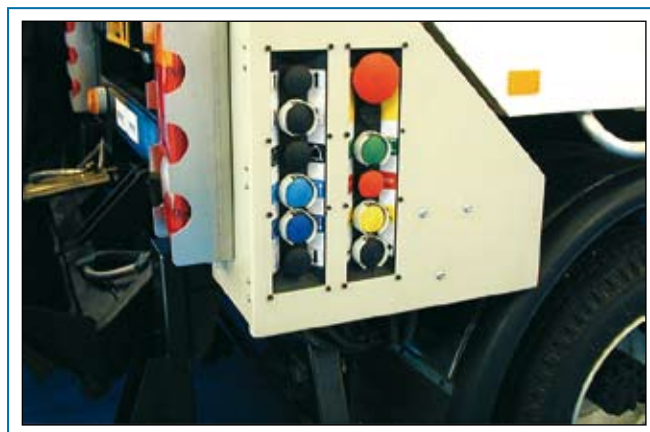
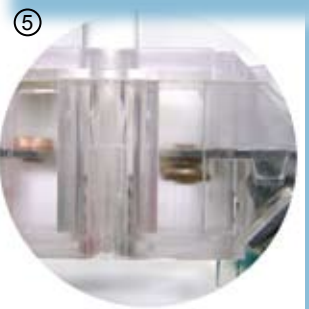
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Pushbuttons



Adaptability
Modularity
Safety
Reliability

New contact blocks



The range of possibilities :

- ① **Button heads adapted to your ergonomics**
 - Illuminated or not
 - Flush or projecting bezels for Ø22 or Ø30 mm cutouts.
 - Round or square.
 - Metal or plastic.
 - Black or chrome-plated (contact us for other colours, finishes, materials).
 - Flush projecting, capped, mushroom buttons.
 - Wide selection of standard colours (contact us for other colours).
- ② **Efficient lighting**
(in all ambient lighting conditions)
 - BA9S lamps with sockets or heads with integrated SMD LEDs.
 - Power supply may be direct or via a transformer.
- ③ **An evolutive making principle**
 - Re-legendable heads.
 - Cover, silk-screened filter or lamp can be replaced from the front, without removing the button.
- ④ **Choice of connections**
 - Screws and brackets or washers, IP2 projection.
 - Single or double tabs for 6,35 mm lugs.
 - Straight, 90°, 45°.
 - (Contact us for other connection types)
- ⑤ **Flexibility and accuracy in the contact solutions**
 - Self cleaning, reinforced contacts.
 - Choice of the contact material depending on the utilisation: low current, harsh atmosphere ...
 - Possibility of modifying the contact sequence using different contact thickness : standard, half-thickness, thick.
 - Addition of a specific module (early breaking, tactile sensation)
- ⑥ **An ultra-modular electric stack**
 - From 1 to 2 lateral contact per tier.
 - 1NO, 1NC, 1NC1NO, 2NC, 2NO.
 - Contact identification per standards, colour code (Green for NO, red for NC).
 - From 1 to 4 tiers (or more, contact us).
 - Variable activation force.
- ⑦ **"A la carte" sealing**
 - Several associations of washers are possible depending on level of water-tightness desired : IP40 to IP67.
 - Cap on pushbutton, bezel gasket, metal washer (also provides protection for thin or fragile supports).
 - Accessory for protecting the electrical stack.
 - Tropicalisation.
- ⑧ **Rugged mode of attachment**
 - Moulded metal body, attachment by punch screws, guaranteeing excellent resistance to shock and vibration.
 - Tapping for earthing

The modular design of MAFELEC's control and signalling components provides for a multitude of combinations and adaptations.

The examples illustrated in this catalogue only represent a fraction of designs produced by our Design Office every day for our customers.

All alternative solutions can be designed from the basic elements, to produce the desired function.



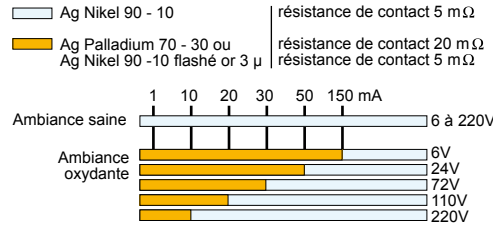
Our equipment complies with the European RoHS directive, restricting the use of certain dangerous substances in electrical equipment.

Compliance with Standards

Certification	CEI NF EN 60947-5-1, CEI NF EN 60077-2, cCSA _{US}
Protective finish	Tropicalization (utilisation +40°C à 95% d'humidité) selon CEI NF EN 60068-2-3IEC and NF EN 61373, IEC and NF EN 60068-2-6
Vibration resistance	
Storage temperature	- 40°C to + 85°C per IEC NF EN 60068-2-1, IEC NF EN 60068-2-2
Operating temperature	- 25°C to + 70°C per IEC NF EN 60068-2-1, IEC NF EN 60068-2-2
Protection against accidental contact with active circuits	IP2x per IEC NF EN 60529 with protector
Fire resistance	Per NF F 16-101/102
Degree of protection	Per IEC NF EN 60529: IP40 without seal, IP66 with TJ seal and capped head
Mechanical service life in millions of switching operations	Pushbuttons : - Momentary : 1 - Illuminated : 0.3 - Push-Push : 0.3 - Latch mushroom pushbutton : 0.1 - Latch mushroom pushbutton, 1/4 turn : 0.1

Characteristics of the contact elements

Rated thermal current	I _{th} = 20A per IEC NF EN 60947-5-1
Rated insulation voltage	U _i = 630V per IEC NF EN 60947-5-1 and IEC NF EN 60077-2
Rated surge voltage	6 kV per IEC NF EN 60947-5-1 and IEC NF EN 60077-2
Contact operation type	Slow make depending action
Activation force	Pushbuttons: 1NC = 8N, 1NO = 10N, 2NC = 13N, 2NO = 13N
Contact material	Standard : AgNi Harsh environment : AgPd Low-current : AgPd gold flash



Maximum number of contacts	Pushbuttons : - Momentary: 8, - Push-Push: 4, - Push-Pull: 4 - Illuminated: 6
Terminal markings	Per IEC NF EN 60947-5-1
Operating power	AC-12 : 230V/15A & 400V/8A AC-15 : 230/8A & 400V/8A DC-12 : 24V/15A & 110V/8A DC-13 : 24V/4A & 110V/1A
Connection	Screw and bracket : min. 1x 0.22 mm ² , max. 2x2.5 mm ² Single or double tab for 6.35 mm clip. Special connection on request

Electrical characteristics : illuminated pushbuttons

Power supply voltages	With LEDs : 6V to 400V AC/DC depending on the model With lamps : 6V to 400V AC/DC depending on the model
Current consumption	With LEDs : from 10 mA to 22 mA With lamps : depends on the lamps
Operating range	0.8 U _n < U < 1.1 U _n

Momentary pushbuttons



22 Standard heads - Ø 22 Range

- Plastic button - Metal bezel - To fit on L22B electrical subassembly.

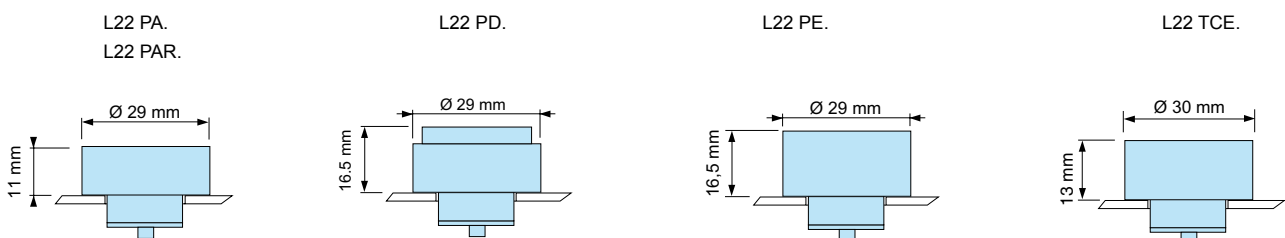
Description	Colour	Part Number		Weight Kg	
Round heads for momentary pushbuttons.		Chrome Bezel	Black Bezel		
Flush pushbutton Metal pushbutton also possible, contact us.	●	L22PAN	L22PANN	0.025	
	●	L22PAV	L22PAVN		
	●	L22PAR	L22PARN		
	●	L22PAJ	L22PAJN		
	●	L22PAB	L22PABN		
	○	L22PAO	L22PAON		
Projecting pushbutton	●	L22PDN	L22PDNN	0.030	
	●	L22PDV	L22PDVN		
	●	L22PDR	L22PDRN		
	●	L22PDJ	L22PDJN		
	●	L22PDB	L22PDBN		
	○	L22PDO	L22PDON		
Recessed pushbutton	●	L22PEN	L22PENN	0.030	
	●	L22PEV	L22PEVN		
	●	L22PER	L22PERN		
	●	L22PEJ	L22PEJN		
	●	L22PEB	L22PEBN		
	○	L22PEO	L22PEON		
Capped pushbutton for IP67 add TJ gasket	●	L22TCEN	L22TCENN	0.026	
	●	L22TCEV	L22TCEVN		
	●	L22TCER	L22TCERN		
	●	L22TCEJ	L22TCEJN		
	●	L22TCEB	L22TCEBN		
	○	L22TCEO	L22TCEON		

22 Heads with markings - Ø 22 Range

- Plastic anti-rotation button - Metal bezel - To fit on L22B.AR electrical subassembly

Description		Part Number		Weight Kg	
Round heads with markings for momentary pushbuttons				0.026	
Flush pushbutton with marking	⏏	L22PAR1	L22PAR1N		
	↑	L22PAR2	L22PAR2N		
	→	L22PAR3	L22PAR3N		
	↓	L22PAR4	L22PAR4N		
	←	L22PAR5	L22PAR5N		
	●	L22PAR0	L22PAR0N		

Dimensions



Momentary pushbuttons



22 Mushroom heads - Ø 22 Range

- Plastic button - Metal bezel - To fit on L22B electrical subassembly.

Description	Colour	Part Number	Weight Kg
Round mushroom heads for momentary pushbutton		Chrome Bezel	Black Bezel
Ø 30 button	●	L22PPN33	L22PPN33N
	●	L22PPV33	L22PPV33N
	●	L22PPR33	L22PPR33N
	●	L22PPJ33	L22PPJ33N
	●	L22PPB33	L22PPB33N
Ø 40 button Metal pushbutton also possible, contact us.	●	L22PPN	L22PPNN
	●	L22PPV	L22PPVN
	●	L22PPR	L22PPRN
	●	L22PPJ	L22PPJN
	●	L22PPB	L22PPBN
Ø 70 button Metal pushbutton also possible, contact us.	●	L22PPN70	L22PPN70N
	●	L22PPV70	L22PPV70N
	●	L22PPR70	L22PPR70N
	●	L22PPJ70	L22PPJ70N
	●	L22PPB70	L22PPB70N



With rubber bellows for IP66 - To fit on L22B. VJ electrical subassembly (add TJ gasket)

Round mushroom heads for momentary pushbutton with bellows

Ø 40 button with button recall spring	●	YSK578D0	0.045
	●	YSK578D8	
	●	YSK578D5	
	●	YSK578D2	
	●	YSK578D4	
	●	YSK578D6	
	●	YSK578D7	
Ø 40 button without button recall spring	●	YSK2087A0	0.047
	●	YSK2087A8	
	●	YSK2087A5	
	●	YSK2087A2	
	●	YSK2087A4	
	●	YSK2087A6	
	●	YSK2087A7	
Ø 70 button	●	YSK2121A0	0.070
	●	YSK2121A5	
	●	YSK2121A2	
	●	YSK2121A4	
	●	YSK2087A6	

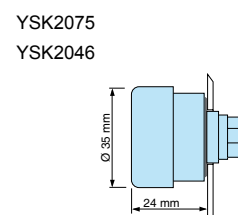
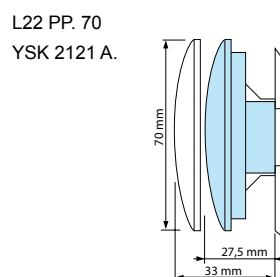
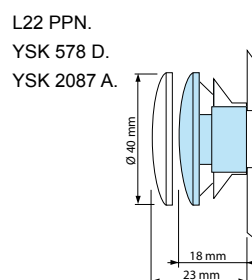
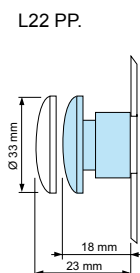


- **Special series** - To fit on L22B. electrical subassembly

Description	Colour	Part Number	Weight Kg
Momentary pushbutton heads.	Chromium	YSK2075	0.095
Metal button Ø 35	Black	YSK2046	



Dimensions



Momentary pushbuttons



22 Standard square heads - Ø 22 Range

- Plastic button and bezel - To fit on L22KB. electrical subassembly- Pictogram can be replaced by the front (special tool, ref: MBK 052)

Description	Colour	Part Number	Weight Kg	
Square heads for momentary pushbuttons Flush pushbutton		Black Bezel	0.011	
	●	L K P A N		
	●	L K P A V		
	●	L K P A R		
	●	L K P A J		
	●	L K P A B U		
Projecting pushbutton	○	L K P A B C	0.011	
	●	L K P D N		
	●	L K P D V		
	●	L K P D R		
	●	L K P D J		
	●	L K P D B		
Mushroom	○	L K P D O	0.015	
	●	L K P P N		
	●	L K P P V		
	●	L K P P R		
	●	L K P P J		

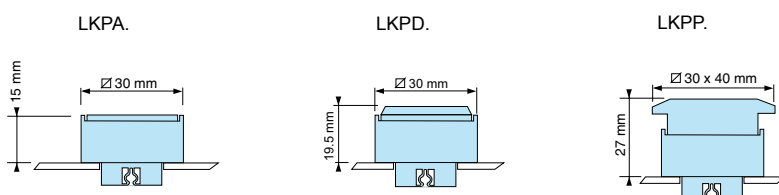
22 Square heads with markings - Ø 22 Range

- Protective cover marking produced by silk-screen printing on the rear of the trim plate or by inserting a silk-screen printed filter (contact us)

Some examples



Dimensions



Momentary pushbuttons



30 Standard heads - Ø 30 Range

- Plastic button - Metal bezel - To fit on L22B. electrical subassembly

Description	Colour	Part Number		Weight Kg
Round heads for momentary pushbuttons Flush pushbutton		Chrome Bezel	Black Bezel	0.013
	●	L A A R 0 1	L A A R 0 2	
	●	L A A R 2 1	L A A R 2 2	
	●	L A A R 4 1	L A A R 4 2	
	●	L A A R 5 1	L A A R 5 2	
	●	L A A R 6 1	L A A R 6 2	
	●	L A A R 8 1	L A A R 8 2	
	○	L A A R 9 1	L A A R 9 2	

Ring MAL924A1 + washer EDU750A1 must be added when mounting control components from the 30 mm range (see accessories chapter).



30 Heads with markings - Ø 30 Range

- Plastic button - Metal bezel - To fit on L22B.AR electrical subassembly

Description		Part Number		Weight Kg
Round heads with markings for momentary pushbuttons Flush pushbutton		Chrome Bezel	Black Bezel	0.013
	⬆	L A A R 5 - A R 1 1	L A A R 5 - A R 1 2	
	⬆	L A A R 9 - A R 2 1	L A A R 9 - A R 2 2	
	➡	L A A R 9 - A R 3 1	L A A R 9 - A R 3 2	
	⬇	L A A R 0 - A R 4 1	L A A R 0 - A R 4 2	
	⬅	L A A R 0 - A R 5 1	L A A R 0 - A R 5 2	
	●	L A A R 2 - A R 0 1	L A A R 2 - A R 0 2	

Ring MAL924A1 + washer EDU750A1 must be added when mounting control components from the 30 mm range (see accessories chapter).



30 Mushroom heads - Ø 30 Range

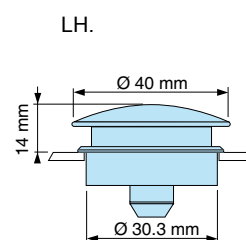
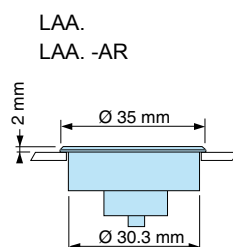
- Plastic button - Metal bezel - To fit on L22B. electrical subassembly

Description	Colour	Part Number		Weight Kg
Round mushroom heads for momentary pushbuttons Ø 40 button		Chrome Bezel	Black Bezel	0.065
	●	L H R 0 1	L H R 0 2	
	●	L H R 2 1	L H R 2 2	
	●	L H R 4 1	L H R 4 2	
	●	L H R 5 1	L H R 5 2	
	●	L H R 6 1	L H R 6 2	
	●	L H R 8 1	L H R 8 2	

Ring MAL924A1 + washer EDU750A1 must be added when mounting control components from the 30 mm range (see accessories chapter).



Dimensions



Momentary pushbuttons



22 22 30 Electrical subassemblies

- Metal body - Attachment by punch screws
- 1 or 2 contacts per tier
- Connection by double tab for 6.35 mm clip

Description	Contact	Schematic	Part Number		Weight Kg	
			For round heads	For square heads		
Electrical subassemblies for standard momentary pushbuttons	1NO		L22B1F TJ	L22KB1F TJ	0.065	
	1NC		L22B1O TJ	L22KB1O TJ	0.065	
	1NC1NO		L22B1O1F TJ	L22KB1O1F TJ	0.070	
	2NO		L22B2F TJ	L22KB2F TJ	0.070	
	2NC		L22B2O TJ	L22KB2O TJ	0.070	
	3NO		L22B3F TJ	L22KB3F TJ	0.085	
	3NC		L22B3O TJ	L22KB3O TJ	0.085	
With offset make and early break (EB) contact	1NO+1NO EB		L22B1F1FOA TJ	L22KB1F1FOA TJ	0.085	
With offset make contact	1NO+1NO 1NC		L22B1F1F1O TJ	L22KB1F1F1O TJ	0.085	
With thick contact	1NC 1NO		L22B1O1FRC TJ	L22KB1O1FRC TJ	0.070	

To obtain minimum IP65 degree of protection, you have to write the TJ gasket
Example: L22B1O1F TJ

Electrical subassemblies for pushbuttons with marked heads (anti-rotation). Add AR before TJ (watertight version not possible)
Example: L22B1O1FF2 AR TJ

Dimensions and cutouts

Add 16 mm to the height for each additional contact tier
Support thickness : 1 to 6 mm

22 L22B. / L22B. RC

L22 B.OA

Standard buttons

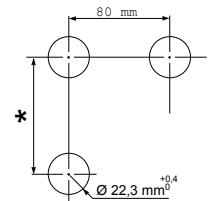
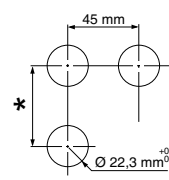
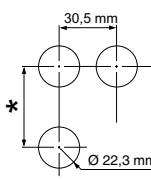
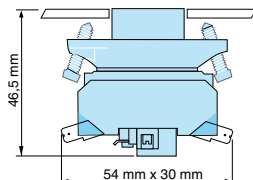
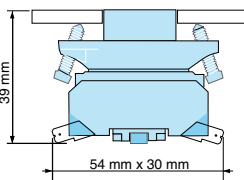
Ø 30 button
30x30 button

Mushroom type buttons

Ø 30 button
30x30 button Ø 70 button

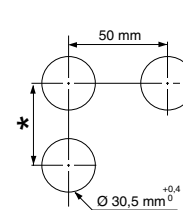
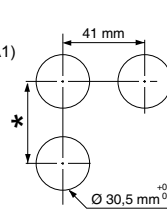
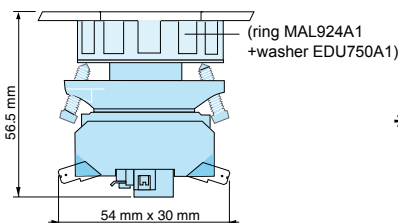
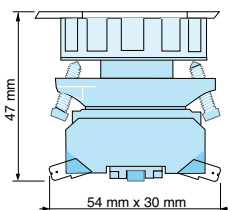
22 L22KB. / L22KB. RC

L22KB.OA



30 L22B. / L22B. RC

L22B.OA



* 90 mm : tabs 6.35 mm
60 mm : IP2 screw/bracket

Momentary pushbuttons



22 Momentary key switches - complete units - Ø 22 Range

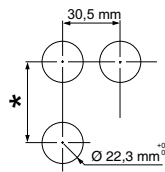
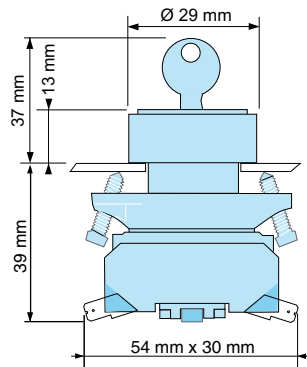
- Chrome-plated metal bezel.
- 2 contacts (4 contacts max. on request)

Description	Contact	Schematic	Couleur	Part Number	Weight Kg
Key withdraw from 1 position	1NO1NC		●	22BASN1O1F19TJ	0,115
			●	22BASV1O1F19TJ	
			●	22BASR1O1F19TJ	
			●	22BASJ1O1F19TJ	
			●	22BASB1O1F19TJ	
			○	22BASO1O1F19TJ	
Key withdraw from 2 positions	1NO1NC		●	22BASN1O1F111TJ	0,115
			●	22BASV1O1F111TJ	
			●	22BASR1O1F111TJ	
			●	22BASJ1O1F111TJ	
			●	22BASB1O1F111TJ	
			○	22BASO1O1F111TJ	



Dimensions and cutouts

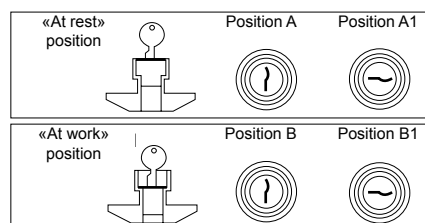
Support thickness : 1 to 6 mm



* 90 mm : Tabs 6.35 mm
60 mm : IP2 screw/

Operating Schematic

Operating Schematic No.	Schematic	Usable Positions	Lockable Button	Key can be withdrawn in positions
9		A1-A-B	A1	A1
11		A1-A-B-B1	A1-B1	A1-B1



Latch «push-push» pushbuttons

22 Latch «push-push» heads - Ø 22 Range

- Metal bezel - Plastic button - To fit on L22BPP. electrical subassemblies

Description	Colour	Part Number	Weight Kg
Round heads for lacht pushbuttons Flush pushbutton		Chrome Bezel	Black Bezel
	●	L22PLAN	L22PLANN
	●	L22PLAV	L22PLAVN
	●	L22PLAR	L22PLARN
	●	L22PLAJ	L22PLAJN
	●	L22PLAB	L22PLABN
	○	L22PLAO	L22PLAON
Projecting pushbutton	●	L22PLDN	L22PLDNN
	●	L22PLDV	L22PLDVN
	●	L22PLDR	L22PLDRN
	●	L22PLDJ	L22PLDJN
	●	L22PLDB	L22PLDBN
	○	L22PLDO	L22PLDON
	Capped pushbutton	●	L22TCELN
●		L22TCELV	L22TCELVN
●		L22TCELR	L22TCELRN
●		L22TCELJ	L22TCELJN
●		L22TCELB	L22TCELBN
○		L22TCELO	L22TCELON

22 Re-legendable latch «push-push» heads - Ø 22 Range

- Metal bezel - Polycarbonate protectiv cover - Pictogram can be replaced by the front (special tool, ref. EDP1069 A1)
- To fit on L22KBPP. electrical subassemblies

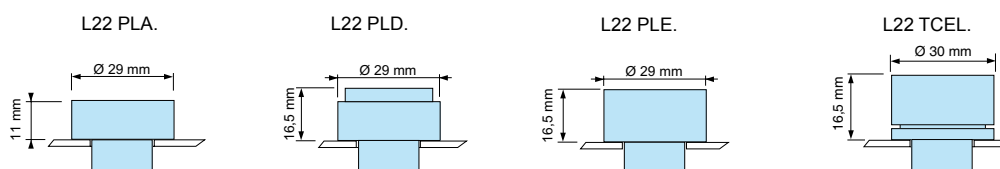
Description	Colour	Part Number	Weight Kg
Re-legendable round heads for latch «push-push» pushbuttons : Flush pushbutton		Chrome Bezel	Black Bezel
	●	K1LR2S	K5LR2S
	●	K1LR3S	K5LR3S
	●	K1LR4S	K5LR4S
	●	K1LR5S	K5LR5S
	●	K1LR6S	K5LR6S
	○	K1LR9S	K5LR9S
Blank label ① Text and pictogram on request	⊗	K1LR1S	K5LR1S

Extraction tool

Multiple degree of protection possible : IP40 to IP65

Dimensions

22



Latch «push-push» pushbuttons

22 Square heads - Ø 22 Range

- Plastic button and bezel - To fit on L22KBPP. electric subassemblies
- Pictogram can be replaced by the front (special tool, ref: MBK 052)

Description	Colour	Part Number	Weight Kg
Square heads for latch «push-push» pushbuttons		Black Bezel	
Flush pushbutton	●	LKPAPPN	0.011
	●	LKPAPPV	
	●	LKPAPPR	
	●	LKPAPPJ	
	●	LKPAPPB	
	○	LKPAPPBO	
Projecting pushbutton	●	LKPDPPN	0.011
	●	LKPDPPV	
	●	LKPDPPR	
	●	LKPDPPJ	
	●	LKPDPPB	
	○	LKPDPPO	



22 Square heads with markings - Ø 22 Range

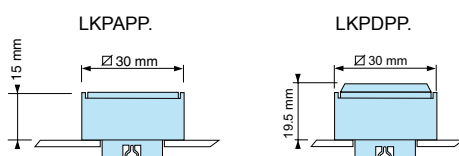
- Protective cover marking produced by silk-screen printing on the rear of the trim plate or by inserting a silk-screen printed mask (contact us)

Some examples



Dimensions

22



Latch «push-push» pushbuttons



30 Latch «push-push» heads - Ø 30 Range

- Metal bezel - Plastic button - To fit on L22BPP. electrical subassemblies

Description	Colour	Part Number		Weight Kg
Round heads for latch button Flush pushbutton	●	Chrome Bezel	Black Bezel	0.022
	●	LABR21	LABR22	
	●	LABR31	LABR32	
	●	LABR41	LABR42	
	●	LABR51	LABR52	
	●	LABR61	LABR62	
Ring MAL924B1 + washer EDU750A1 must be added when mounting control components from the 30 mm range (see accessories chapter)	○	LABR91	LABR92	



30 Re-legendable head for latch «push-push» pushbutton - Ø 30 Range

- Metal bezel - Polycarbonate protective cover - Pictogram can be replaced by the front (special tool, ref: EDP1069 A1)
- To fit on L22KBPP. electric subassemblies

Description	Colour	Part Number		Weight Kg
Re-legendable round heads for latch pushbuttons : Marking on head can be changed. Flush pushbutton	●	Chrome Bezel	Black Bezel	0.010
	●	L1LR2S	L5LR2S	
	●	L1LR3S	L5LR3S	
	●	L1LR4S	L5LR4S	
	●	L1LR5S	L5LR5S	
	●	L1LR6S	L5LR6S	
Ring MAL924B1 + washer EDU750A1 must be added when mounting control components from the 30 mm range (provided)	○	L1LR9S	L5LR9S	
	⊗	L1LR1S	L5LR1S	

New !



Blank label ①
Text and pictogram on request

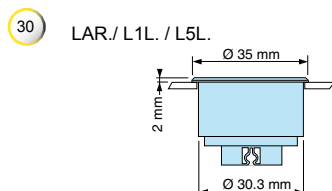


Other version :
Flush Square head :
- Ø37 mm
- cutout Ø30 mm^{+0.2}
- Tightening torque of punch screws : 0.2 N.m
Contact us.

Multiple degree of protection possible : IP40 to IP65



Dimensions



Latch «push-push» pushbuttons



22 22 30 Electrical subassemblies

- Fixation par vis pointeaux
- Raccordement par languette double pour clip de 6,35 mm
- 1 ou 2 contacts par étages (ouverts ou fermés)

Description	Contact	Schematic	Part Number		Weight Kg
			For round heads	For re-legendable or square heads	
«push-push» electrical subassemblies	1NO		L22BPP1FTJ	L22KBPP1FTJ	0.065
	1NC		L22BPP1OTJ	L22KBPP1OTJ	0.065
	1NO 1NC		L22BPP1O1FTJ	L22KBPP1O1FTJ	0.070
	2NO		L22BPP2FTJ	L22KBPP2FTJ	0.070
	2NC		L22BPP2OTJ	L22KBPP2OTJ	0.070

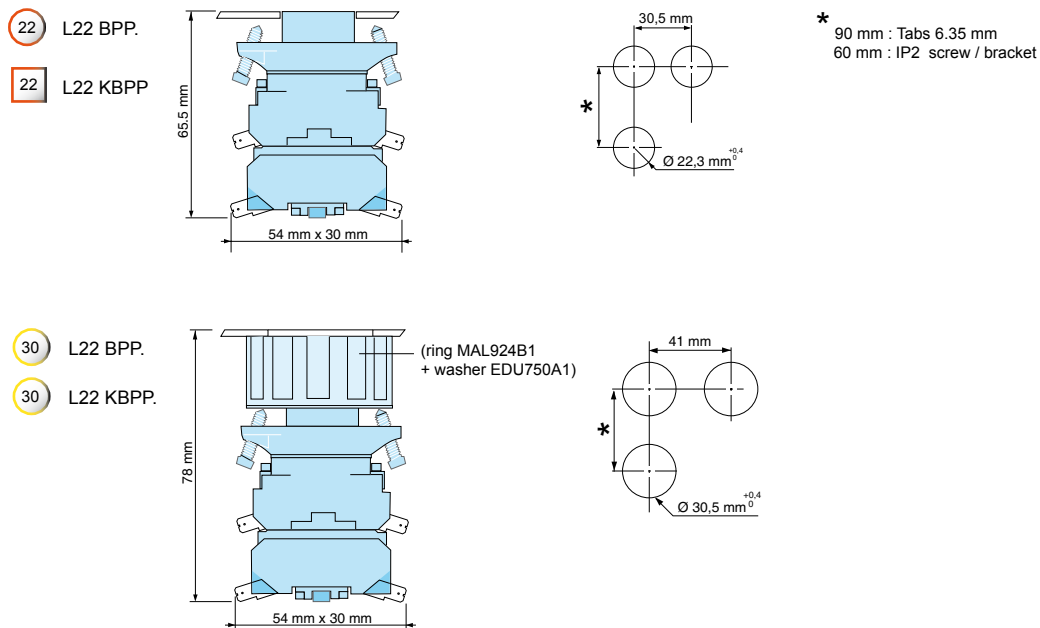
For IP55 degree of protection, add TJ

Example: L22 BPP 1F **TJ**



Dimensions - Cutouts

Support thickness : 1 to 6 mm



Latch Mushroom pushbuttons



22 Latch mushroom pushbuttons - Complete units - Ø 22 Range

- Chrome metal bezel - Metal body - Plastic button
- Attachment by punch screws - 1 or 2 contacts per tier - Connection IP2X screw and bracket

Description	Contact	Schematic	Part Number	Weight Kg
Mushroom «push-turn» pushbutton Ø 40 button	1NC		L 2 2 B P V T R 1 O T J	0.160
	1NO 1NC		L 2 2 B P V T R 1 O 1 F T J	0.165
	2NC		L 2 2 B P V T R 2 O T J	0.165
Mushroom «push-pull» pushbutton Ø 40 button	1NC		L 2 2 B P M R 1 O T J	0.150
	1NO 1NC		L 2 2 B P M R 1 O 1 F T J	0.155
Mushroom «push-pull» pushbutton Ø 70 button	1NC		L 2 2 B P M R 7 0 1 O T J	0.180
	1NO 1NC		L 2 2 B P M R 7 0 1 O 1 F T J	0.185
Mushroom «push-pull» pushbutton Ø 40 button with protective bellows for IP67	1NC		Y S K 2 0 9 2 A 2 1 O T J	0.150
	1NO 1NC		Y S K 2 0 9 2 A 2 1 O 1 F T J	0.155
	2NC		Y S K 2 0 9 2 A 2 2 O T J	0.155
Mushroom «push-pull» pushbutton Ø 70 button with protective bellows for IP67	1NC		Y S K 2 0 8 9 A 2 1 O T J	0.180
	1NO 1NC		Y S K 2 0 8 9 A 2 1 O 1 F T J	0.185
	2NC		Y S K 2 0 8 9 A 2 2 O T J	0.185

For connection by tab for 6.35 mm clip
add F2 at the end of the P/N

Example: YSR2089A22ORC **F2**



22 Latch mushroom pushbuttons (clip-on electric tier) - Complete units - Ø 22 Range

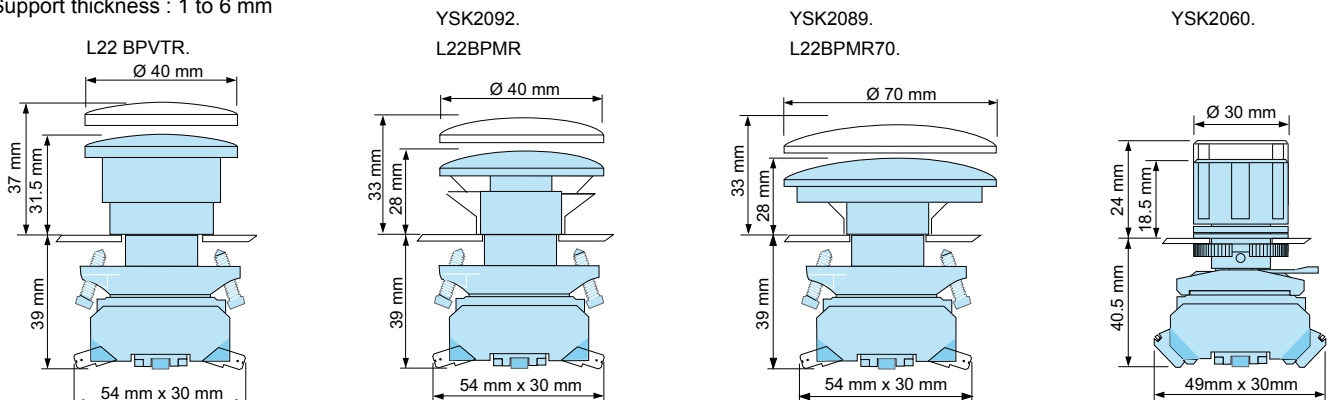
- Plastic button and body assembly - Attachment by plastic nut
- 1 tier with 1 or 2 contacts - Quick to install (without screw) - Connection by screw and bracket.

Description	Contact	Schematic	Part Number	Weight Kg
Mushroom «push-turn» pushbutton Ø 30 button	1NC		Y S K 2 0 6 0 A 2 1 O V T J	0.050
	2NC		Y S K 2 0 6 0 A 2 2 O V T J	0.055
	1NO 1NC			



Dimensions - Cutouts

Support thickness : 1 to 6 mm



Latch Mushroom pushbuttons



22 Latch mushroom pushbuttons with key - Complete units - Ø 22 Range

- Chrome metal bezel - Metal body - Plastic button
- Attachment by punch screws - 1 or 2 contacts per tier - Connection IP2X screw and bracket

Description	Contact	Schematic	Part Number	Weight Kg
Latch mushroom pushbutton Ø 40 button release with Ronis 455 key	1NC		L22BPVSR401O1TJ	0.160
	1NO 1NC		L22BPVSR401O1F1TJ	0.170
	2NC		L22BPVSR402O1F1TJ	0.170
Latch mushroom pushbutton Ø 40 button release with Ronis 620 key	1NC		L22BPSR1O620TJ	0.110
	1NO 1NC		L22BPSR1O1F620TJ	0.125
	2NC		L22BPSR2O620TJ	0.125
Latch mushroom pushbutton Ø 70 button release with Ronis 455 key	1NC		L22BPVSR701O1TJ	0.170
	1NO 1NC		L22BPVSR701O1F1TJ	0.180
	2NC		L22BPVSR702O1TJ	0.180



For connection by tab for 6.35 mm clip
add F2 at the end of the P/N

Example: L22BPVSR702O1TJ **F2**

22 Latch mushroom pushbuttons with key (clip-on electric tier) - Complete units - Ø 22 Range

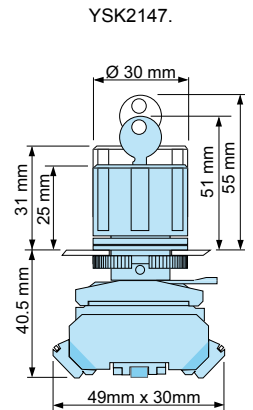
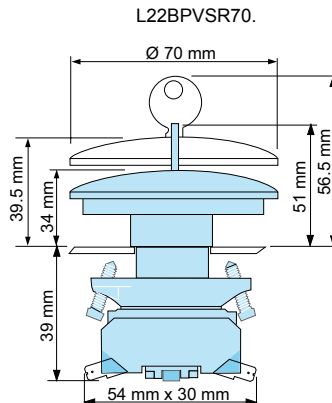
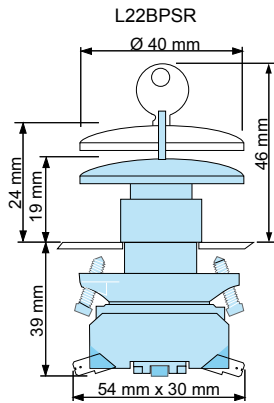
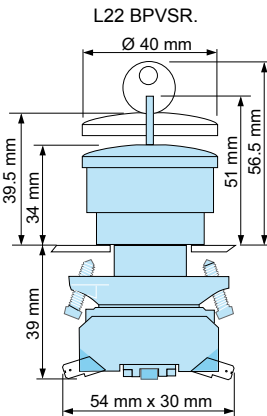
- Plastic button and body assembly - Attachment by plastic nut
- 1 tier with 1 or 2 contacts - Quick to install (without screw) - Connection by screw and bracket.

Description	Contact	Schematic	Part Number	Weight Kg
Latch mushroom pushbutton Ø 30 button release with Ronis 455 key	1NC		YSK2147A21OTJ	0,055
	1NO 1NC		YSK2147A21O1FTJ	0,060
	2NC		YSK2147A22OTJ	0,060

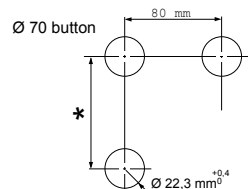
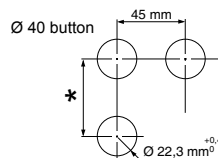


Dimensions - Cutouts

Support thickness : 1 to 6 mm



* 90 mm : Tabs 6.35 mm
60 mm : IP2x screw / bracket






Illuminated momentary pushbuttons







22 Round heads for LED pushbuttons - Ø 22 Range

- Metal bezel - Polycarbonate protective cover - To fit on KRD RR electrical subassemblies (except for blue colour and protective cover with cap)

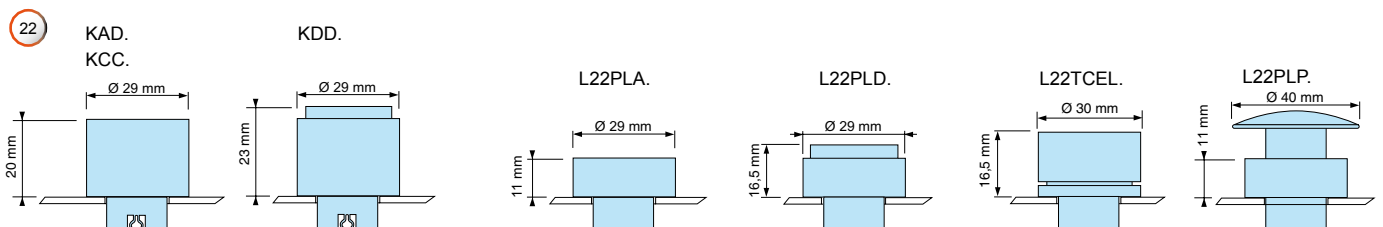
Description	Colour	Part Number	Weight Kg	
Round heads for pushbuttons illuminated with SMD LEDs Flush pushbutton		Chrome Bezel	Black Bezel	
	●	KADR51	KADR55	
	●	KADR21	KADR25	
	●	KADR41	KADR45	
	●	KADR31	KADR35	
To fit on body : KRD 6R	●	KADR61	KADR65	
Projecting pushbutton	●	KDDR51	KDDR55	
	●	KDDR21	KDDR25	
	●	KDDR41	KDDR45	
	●	KDDR31	KDDR35	
	To fit on body : KRD 6R	●	KDDR61	
Round heads for pushbuttons illuminated with Ø 5mm LEDs Capped button To fit on body : KRC RR	●	KCCR51	KCCR55	
	●	KCCR21	KCCR25	
	●	KCCR41	KCCR45	
	●	KCCR31	KCCR35	
	To fit on body : KRC 6R	●	KCCR61	

22 Round heads for pushbuttons with lamps - Ø 22 Range

- Metal bezel - Polycarbonate protective cover - To fit on L22BL. electrical subassemblies

Description	Colour	Part Number	Weight Kg	
Round heads for pushbuttons illuminated with lamps Flush pushbutton		Chrome Bezel	Black Bezel	
	●	L22PLAV	L22PLAVN	
	●	L22PLAR	L22PLARN	
	●	L22PLAJ	L22PLAJN	
	●	L22PLAB	L22PLABN	
	○	L22PLAO	L22PLAON	
Projecting pushbutton	●	L22PLDV	L22PLDVN	
	●	L22PLDR	L22PLDRN	
	●	L22PLDJ	L22PLDJN	
	●	L22PLDB	L22PLDBN	
	●	L22PLDO	L22PLDON	
	○			
Capped pushbutton	●	L22TCELV	L22TCELVN	
	●	L22TCELR	L22TCELRN	
	●	L22TCELJ	L22TCELJN	
	●	L22TCELB	L22TCELBN	
	●	L22TCELO	L22TCELO	
	○			
Mushroom Ø 40 button	●	L22PLPV	L22PLPVN	
	●	L22PLPR	L22PLPRN	
	●	L22PLPJ	L22PLPJN	
	●	L22PLPB	L22PLPBN	
	●	L22PLPO	L22PLPON	
	○			

Dimensions



Illuminated momentary pushbuttons



22 Re-legendable round heads for illuminated pushbuttons - Ø 22 Range

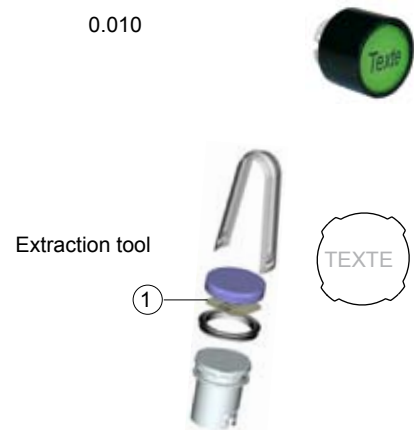
- Metal bezel - Polycarbonate protective cover
- Pictogram and lamp can be replaced by the front (special tool, ref: EDP1069 A1)
- To fit on L22KBL. electrical subassemblies

Description	Colour	Part Number	Weight Kg
Re-legendable round heads for illuminated pushbuttons Flush pushbutton	●	Chrome Bezel	Black Bezel
	●	K1LR2S	K5LR2S
	●	K1LR3S	K5LR3S
	●	K1LR4S	K5LR4S
	●	K1LR5S	K5LR5S
	●	K1LR6S	K5LR6S
	○	K1LR9S	K5LR9S
	⊗	K1LR1S	K5LR1S

New !

Blank label ①
Text and pictogram on request

Multiple degree of protection possible : IP40 to IP65



22 Square illuminated heads for Ba9S lamps - Ø 22 Range

- Plastic button and bezel - To fit on L22KBL. electrical subassemblies
- Versions with integrated LEDs possible (contact us)
- Pictogram and lamp can be replaced by the front (special tool, ref: MBK 052)

Description	Colour	Part Number	Weight Kg
Square heads for pushbuttons illuminated with Ba9S lamps Flush pushbutton	●	Black Bezel	0.011
	●	LKPALN	
	●	LKPALV	
	●	LKPALR	
	●	LKPALJ	
	●	LKPALB	
	○	LKPALO	
Projecting pushbutton	●	LKPDLN	0.011
	●	LKPDLV	
	●	LKPDLR	
	●	LKPDLJ	
	●	LKPDLB	
	○	LKPDLO	
	⊗	LKPDLI	



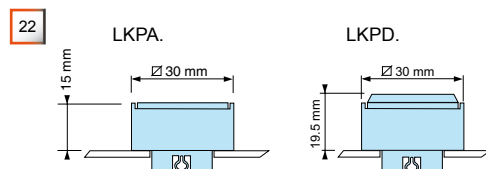
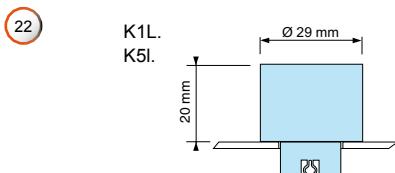
22 Re-legendable square heads - Ø 22 Range

- Protective cover marking produced by silk-screen printing on the rear of the trim plate or by inserting a silk-screen printed mask (contact us)

Some examples



Dimensions



Illuminated momentary pushbuttons



30 Round heads with integrated LEDs - Ø 30 Range

- Metal bezel - Polycarbonate protective cover - To fit on LRC. electrical subassemblies

Description	Colour	Part Number	Weight Kg	
Round heads for standard pushbuttons illuminated with LEDs. Flush pushbutton		Chrome Bezel	Black Bezel	
	●	LAR22 . 1	LAR22 . 2	0.022
	●	LAR32 . 1	LAR32 . 2	
	●	LAR42 . 1	LAR42 . 2	
	●	LAR52 . 1	LAR52 . 2	
	●	LAR62 . 1	LAR62 . 2	
	○	LAR92 . 1	LAR92 . 2	
Ring MAL924B1 + washer EDU750A1 must be added when mounting control components from the 30 mm range (see accessories chapter)				
Voltage codes	4.....4	24 V		
Complete the P/N	5.....5	48 V		
	6.....6	72 V		
	7.....7	110 V		



30 Re-legendable round heads for illuminated pushbuttons - Ø 30 Range

- Metal bezel - Polycarbonate protective cover - Pictogram and lamp can be replaced by the front (special tool, ref: EDP1069 A1)
- To fit on L22KBL. electrical subassemblies

Description	Colour	Part Number	Weight Kg	
Re-legendable round heads for latch pushbuttons : Markings on heads can be changed. Flush pushbutton		Chrome Bezel	Black Bezel	
	●	L 1 LR 2 S	L 5 LR 2 S	0.010
	●	L 1 LR 3 S	L 5 LR 3 S	
	●	L 1 LR 4 S	L 5 LR 4 S	
	●	L 1 LR 5 S	L 5 LR 5 S	
	●	L 1 LR 6 S	L 5 LR 6 S	
	○	L 1 LR 9 S	L 5 LR 9 S	
⊗	L 1 LR 1 S	L 5 LR 1 S		

New !



Blank label ①
Text and pictogram on request

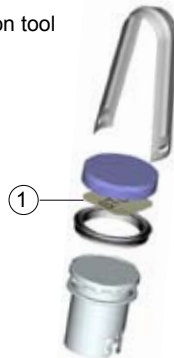


Other version : Square head (Ø37 mm, cutout Ø30 mm⁺⁰²), contact us.



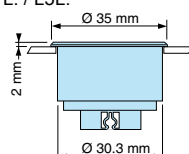
Multiple degree of protection possible : IP40 to IP65

Extraction tool



Dimensions

30 LAR./ L1L. / L5L.



Illuminated momentary pushbuttons



22 Electrical subassemblies for pushbuttons with lamps - Ø 22 Range

- Metal body - Attachment by punch screws - Connection by double tabs for 6.35 mm clip
- Lighting tier : Ba9S socket lamp - Max. P : 3W
- Contact stack : 1 or 2 contacts per tier. (possibility of 3 tiers, with 6 contacts, contact us)

Description	Contact	Schematic	Part Number		Weight Kg
			For round heads	For square or re-legendable heads	
Electrical subassemblies for pushbuttons illuminated with lamps. Direct power supply. Lamp not supplied.	1NO		L22BL1FTJ	L22KBL1FTJ	0.090
	1NC		L22BL1OTJ	L22KBL1OTJ	0.090
	1NO 1NC		L22BL1O1FTJ	L22KBL1O1FTJ	0.100
	2NO		L22BL2FTJ	L22KBL2FTJ	0.100
	2NC		L22BL2OTJ	L22KBL2OTJ	0.100
Electrical subassemblies for pushbuttons illuminated with lamps. Current-limiting resistor 130V / 48V Lamp supplied.	1NO		L22BL1FRE3TJ	L22KBL1FRE3TJ	0.095
	1NC		L22BL1ORE3TJ	L22KBL1ORE3TJ	0.095
	1NO 1NC		L22BL1O1FRE3TJ	L22KBL1O1FRE3TJ	0.105
	2NO		L22BL2FRE3TJ	L22KBL2FRE3TJ	0.105
	2NC		L22BL2ORE3TJ	L22KBL2ORE3TJ	0.105
Electrical subassemblies for pushbuttons illuminated with lamps. Transformer Lamp supplied.	1NO		L22BL1F .. TJ	L22KBL1F .. TJ	0.150
	1NC		L22BL1O .. TJ	L22KBL1O .. TJ	0.150
	1NO 1NC		L22BL1O1F .. TJ	L22KBL1O1F .. TJ	0.160
	2NO		L22BL2F .. TJ	L22KBL2F .. TJ	0.160
	2NC		L22BL2O .. TJ	L22KBL2O .. TJ	0.160

Voltage code, complete the P/N :

Transformer = T1
 50Hz - 130V / 6V -
 60Hz - 110V/120V / 6V
 Transformer = T2
 50Hz - 230V / 6V

For IP55 degree of protection, add TJ

Example: L22BL2OT1 TJ

22 Electrical subassemblies for pushbuttons with SMD LEDs - Ø 22 Range

- Metal body - Attachment by punch screws - Connection by double tabs for 6.35 mm clip
- Lighting tier : Receptacle for LED lighting head.
- Contact stack : 1 or 2 contacts per tier. (possibility of 3 tiers, with 6 contacts, contact us)

Description	Contact	Schematic	Part Number		Weight Kg
			Blue	Other colour	
Electrical subassemblies for pushbuttons illuminated by SMD LED	1NO		Blue	KRD6R .. F2 R1TJ	0.130
			Other colour	KRDRR .. F2 R1TJ	
	1NC		Blue	KRD6R .. F2 1RTJ	0.130
			Other colour	KRDRR .. F2 1RTJ	
	1NO 1NC		Blue	KRD6R .. F2 11TJ	0.140
			Other colour	KRDRR .. F2 11TJ	
	2NO		Blue	KRD6R .. F2 R2TJ	0.140
			Other colour	KRDRR .. F2 R2TJ	
	2NC		Blue	KRD6R .. F2 2RTJ	0.140
			Other colour	KRDRR .. F2 2RTJ	

Voltage code, complete the P/N :
 24V = 04
 48V = 05
 72V = 06

For connection by screw and bracket replace F2 by V2

Example: KRDRR04 V2 2RTJ

Illuminated momentary pushbuttons



22 Electrical subassemblies for pushbuttons with Ø 5mm LEDs - Ø 22 Range

- Metal body - Attachment by punch screws - Connection by double tabs for 6.35 mm clip
- Lighting tier : Receptacle for LED lighting head - Contact stack : 1 or 2 contacts per tier. (possibility of 3 tiers, with 6 contacts, contact us)

Description	Contact	Schematic	Part Number	Weight Kg
Sous ensembles électriques pour boutons poussoirs lumineux à LED Ø 5mm	1NO		Blue KRC6R .. F2 R1TJ Other colour KRCRR .. F2 R1TJ	0.130
	1NC		Blue KRC6R .. F2 1RTJ Other colour KRCRR .. F2 1RTJ	0.130
	1NO 1NC		Blue KRC6R .. F2 11TJ Other colour KRCRR .. F2 11TJ	0.140
	2NO		Blue KRC6R .. F2 R2TJ Other colour KRCRR .. F2 R2TJ	0.140
	2NC		Blue KRC6R .. F2 2RTJ Other colour KRCRR .. F2 2RTJ	0.140

Voltage code, complete the P/N : 12V = 03
24V = 04
48V = 05

For connection by screw and bracket
replace F2 by **V2**
Example: **KRC6R05 V2 R1TJ**



30 Electrical subassemblies for pushbuttons with SMD LED - Ø 30 Range

- Metal body - Attachment by punch screws - Connection by double tabs for 6.35 mm clip - Non polarity
- Lighting tier : Receptacle for SMD LED lighting head - Contact stack : 1 or 2 contacts per tier (possibility of 3 tiers, with 6 contacts, contact us)

Description	Contact	Schematic	Part Number	Weight Kg
Electrical subassemblies for pushbuttons illuminated by SMD LEDs	1NO		LRCR2 .. F2 R1TJ LRCR3 .. F2 R1TJ LRCR4 .. F2 R1TJ LRCR5 .. F2 R1TJ LRCR6 .. F2 R1TJ LRCR9 .. F2 R1TJ	0.130
	1NC		LRCR2 .. F2 1RTJ LRCR3 .. F2 1RTJ LRCR4 .. F2 1RTJ LRCR5 .. F2 1RTJ LRCR6 .. F2 1RTJ LRCR9 .. F2 1RTJ	
	1NO 1NC		LRCR2 .. F2 11TJ LRCR3 .. F2 11TJ LRCR4 .. F2 11TJ LRCR5 .. F2 11TJ LRCR6 .. F2 11TJ LRCR9 .. F2 11TJ	
	2NO		LRCR2 .. F2 R2TJ LRCR3 .. F2 R2TJ LRCR4 .. F2 R2TJ LRCR5 .. F2 R2TJ LRCR6 .. F2 R2TJ LRCR9 .. F2 R2TJ	
	2NC		LRCR2 .. F2 2RTJ LRCR3 .. F2 2RTJ LRCR4 .. F2 2RTJ LRCR5 .. F2 2RTJ LRCR6 .. F2 2RTJ LRCR9 .. F2 2RTJ	

Voltage code, complete the P/N : 24V = 04
48V = 05
72V = 06
110V = 07

For connection by screw and bracket
replace F2 by **V2**
Example: **LRCR9 .. V2 R1TJ**

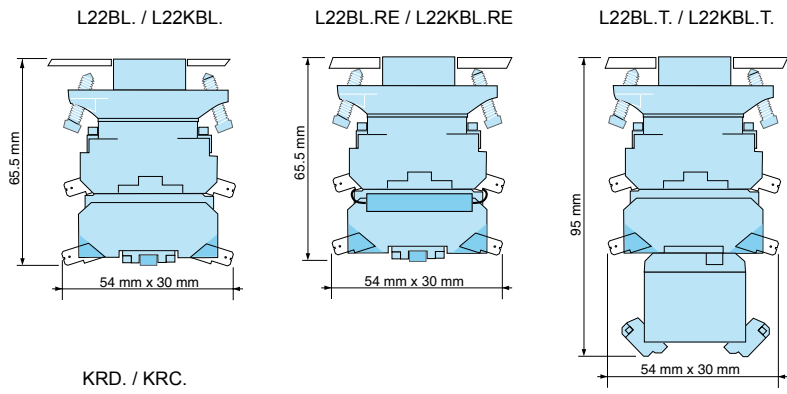


Electrical subassemblies

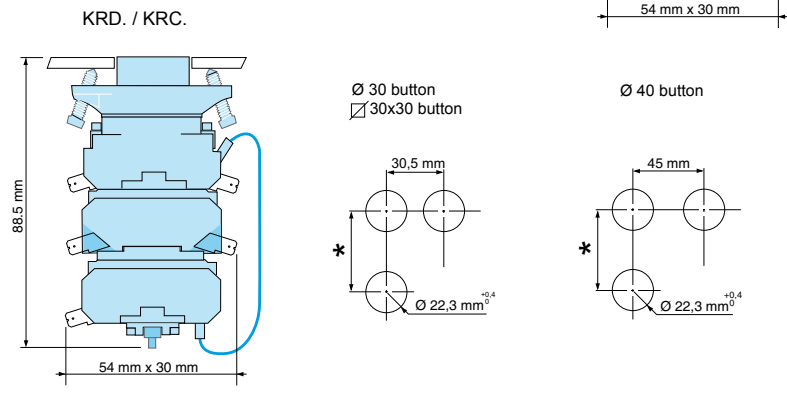
Dimensions - Cutouts

Support thickness : 1 to 6 mm

22 22

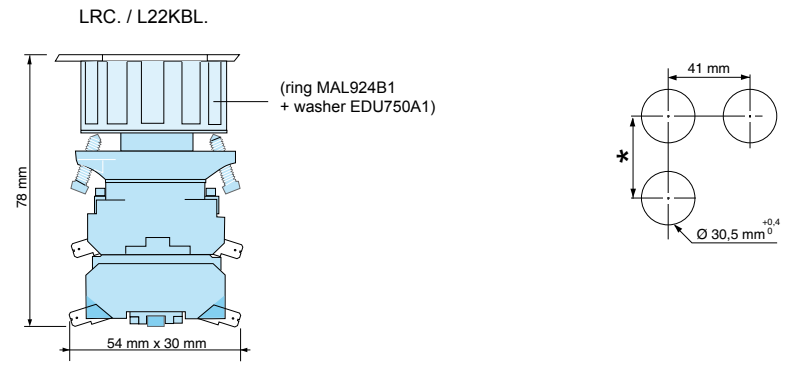


22



* 90 mm : Tabs 6.35 mm
60 mm : IP2x screw / bracket

30



Illuminated latch pushbuttons



22 Round heads for LED pushbutton - Ø 22 Range

- Metal bezel - Polycarbonate protective cover - To fit on KRH RR electrical subassemblies (except for blue colour and protective cover with cap)

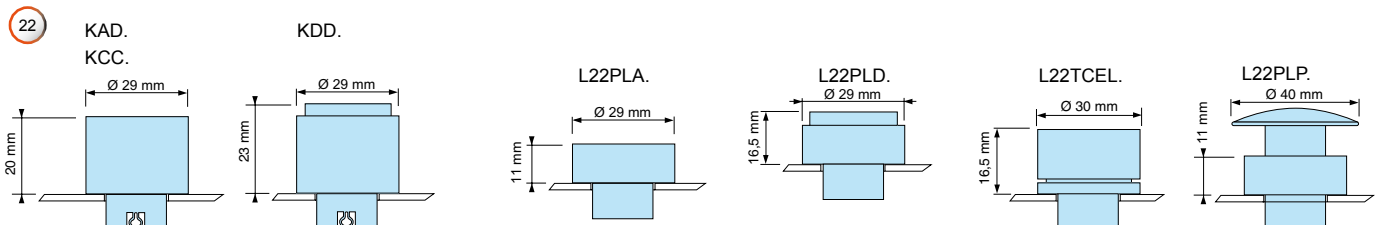
Description	Colour	Part Number		Weight Kg	
Round heads for pushbuttons illuminated by SMD LEDs Flush pushbutton	●	Chrome Bezel	Black Bezel	0.025	
	●	KADR51	KADR55		
	●	KADR21	KADR25		
	●	KADR41	KADR45		
	●	KADR31	KADR35		
To fit on body : KRH 6R	●	KADR61	KADR65		
Projecting pushbutton	●	KDDR51	KDDR55	0.025	
	●	KDDR21	KDDR25		
	●	KDDR41	KDDR45		
	●	KDDR31	KDDR35		
	To fit on body : KRH 6R	●	KDDR61		
Round heads for pushbuttons illuminated by Ø 5mm LEDs Capped pushbutton To fit on body : KRG RR	●	KCCR51	KCCR55	0.025	
	●	KCCR21	KCCR25		
	●	KCCR41	KCCR45		
	●	KCCR31	KCCR35		
	To fit on body : KRG 6R	●	KCCR61		

22 Round heads for pushbuttons with lamps - Ø 22 Range

- Metal bezel - Polycarbonate protective cover - To fit on L22BLPP. electrical subassemblies

Description	Colour	Part Number		Weight Kg	
Round heads for pushbuttons illuminated with lamps Flush pushbutton	●	Chrome Bezel	Black Bezel	0.020	
	●	L22PLAV	L22PLAVN		
	●	L22PLAR	L22PLARN		
	●	L22PLAJ	L22PLAJN		
	○	L22PLAO	L22PLAON		
●	L22PLAB	L22PLABN			
Projecting pushbutton	●	L22PLDV	L22PLDVN	0.020	
	●	L22PLDR	L22PLDRN		
	●	L22PLDJ	L22PLDJN		
	○	L22PLDO	L22PLDON		
	●	L22PLDB	L22PLDBN		
Capped pushbutton	●	L22TCEV	L22TCEVN	0.030	
	●	L22TCER	L22TCERN		
	●	L22TCEJ	L22TCEJN		
	○	L22TCEO	L22TCEON		
	●	L22TCEB	L22TCEBN		
Mushroom Ø 40 button	●	L22PLPV	L22PLPVN	0.025	
	●	L22PLPR	L22PLPRN		
	●	L22PLPJ	L22PLPJN		
	○	L22PLPO	L22PLPON		
	●	L22PLPB	L22PLPBN		

Dimensions



Illuminated latch pushbuttons



22 Re-legendable heads for «push-push» illuminated pushbuttons - Ø 22 Range

- Metal bezel - Polycarbonate protective cover - Pictogram and lamp can be replaced by the front (special tool ref: EDP 1069 A1)..
- To fit on L22KBLPP electrical subassemblies

Description	Colour	Part Number	Weight Kg
Re-legendable round heads for latch pushbuttons : Markings on heads can be changed Flush pushbutton	●	Chrome Bezel	Black Bezel
	●	K1LR2S	K5LR2S
	●	K1LR3S	K5LR3S
	●	K1LR4S	K5LR4S
	●	K1LR5S	K5LR5S
	●	K1LR6S	K5LR6S
	○	K1LR9S	K5LR9S
	⊗	K1LR1S	K5LR1S

New !



Blank label ①
Text and pictogram on request

Multiple degree of protection possible : IP40 to IP65

22 Square illuminated heads - Ø 22 Range

- Plastic button and bezel - To fit on L22KBL. electrical subassemblies
- Pictogram and lamp can be replaced by the front (special tool, ref: MBK 052)

Description	Colour	Part Number	Weight Kg
Square heads for pushbuttons illuminated with Ba9S lamps Flush pushbutton	●	Black Bezel	0.011
	●	LKPALPPV	
	●	LKPALPPR	
	●	LKPALPPJ	
	●	LKPALPPB	
	○	LKPALPPO	
⊗	LKPALPPI		



Description	Colour	Part Number	Weight Kg
Projecting pushbutton	●	Black Bezel	0.011
	●	LKPDLPV	
	●	LKPDLP R	
	●	LKPDLP J	
	●	LKPDLP B	
	○	LKPDLP O	
⊗	LKPDLP I		



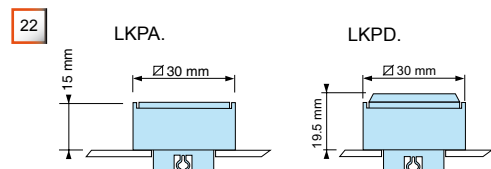
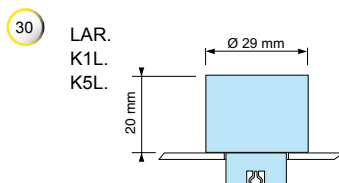
22 Square heads with markings - Ø 22 Range

- Protective cover marking produced by silk-screen printing on the rear of the trim plate or by inserting a silk-screen printed mask (contact us)

Some examples



Dimensions



Illuminated latch pushbuttons



30 Heads with integrated LED - Ø 30 Range

- Metal bezel - Polycarbonate protective cover - To fit on LRE. electrical subassemblies

Description	Colour	Part Number	Weight Kg	
Round heads for standard pushbuttons illuminated with LEDs. Flush pushbutton Ring MAL924B1 + washer EDU750A1 must be added when mounting control components from the 30 mm range (see accessories chapter)		Chrome Bezel	Black Bezel	
	●	LAR22 . 1	LAR22 . 2	0.022
	●	LAR32 . 1	LAR32 . 2	
	●	LAR42 . 1	LAR42 . 2	
	●	LAR52 . 1	LAR52 . 2	
	●	LAR62 . 1	LAR62 . 2	
	○	LAR92 . 1	LAR92 . 2	
Voltage code, complete the P/N :		4.....4	24 V	
		5.....5	48 V	
		6.....6	72 V	
		7.....7	110 V	



30 Re-legendable round heads for «push-push» illuminated pushbuttons - Ø 30 Range

- Metal bezel - Polycarbonate protective cover - Pictogram and lamp can be replaced by the front (special tool, ref: EDP1069 A1)
- To fit on L22KBLPP electrical subassemblies

Description	Colour	Part Number	Weight Kg	
Re-legendable round heads for latch pushbuttons : Markings on heads can be changed. Flush pushbutton Ring MAL924B1 + washer EDU750A1 must be added when mounting control components from the 30 mm range (provided)		Chrome Bezel	Black Bezel	
	●	L 1 LR 2 S	L 5 LR 2 S	0.010
	●	L 1 LR 3 S	L 5 LR 3 S	
	●	L 1 LR 4 S	L 5 LR 4 S	
	●	L 1 LR 5 S	L 5 LR 5 S	
	●	L 1 LR 6 S	L 5 LR 6 S	
	○	L 1 LR 9 S	L 5 LR 9 S	
⊗	L 1 LR 1 S	L 5 LR 1 S		

New !



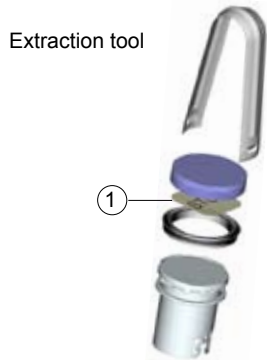
Blank label ①
Text and pictogram on request



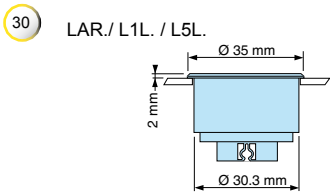
Other version : Square head (Ø37 mm, cutout Ø30 mm⁺⁰²), contact us.



Multiple degree of protection possible : IP40 to IP65



Dimensions



Illuminated latch pushbuttons



22 Electrical subassemblies for pushbuttons with lamps - Ø 22 Range

- Metal body - Attachment by punch screws - Connection by double tabs for 6.35 mm clip
- Lighting tier : Ba9S socket lamps - Max. P : 3W - Contact stack : 1 or 2 contacts per tier. (possibility of 3 tiers, 6 contacts, contact us)

Description	Contact	Schematic	Part Number		Weight Kg
			For round heads	For square or re-legendable heads	
Electrical subassemblies for latch pushbuttons illuminated with lamps. Direct power supply. Lamp not supplied.	1NO		L22BLPP1FTJ	L22KBLPP1FTJ	0.090
	1NC		L22BLPP10TJ	L22KBLPP10TJ	0.090
	1NO 1NC		L22BLPP101FTJ	L22KBLPP101FTJ	0.100
	2NO		L22BLPP2FTJ	L22KBLPP2FTJ	0.100
	2NC		L22BLPP20TJ	L22KBLPP20TJ	0.100
Electrical subassemblies for latch pushbuttons illuminated with lamps. Current-limiting resistor 130V / 48V Lamp supplied.	1NO		L22BLPP1FRE3TJ	L22KBLPP1FRE3TJ	0.095
	1NC		L22BLPP10RE3TJ	L22KBLPP10RE3TJ	0.095
	1NO 1NC		L22BLPP101FRE3TJ	L22KBLPP101FRE3TJ	0.105
	2NO		L22BLPP2FRE3TJ	L22KBLPP2FRE3TJ	0.105
	2NC		L22BLPP20RE3TJ	L22KBLPP20RE3TJ	0.105
Electrical subassemblies for latch pushbuttons illuminated with lamps. Transformer Lamp supplied.	1NO		L22BLPP1F .. TJ	L22KBLPP1F .. TJ	0.150
	1NC		L22BLPP10 .. TJ	L22KBLPP10 .. TJ	0.150
	1NO 1NC		L22BLPP101F .. TJ	L22KBLPP101F .. TJ	0.160
	2NO		L22BLPP2F .. TJ	L22KBLPP2F .. TJ	0.160
	2NC		L22BLPP20 .. TJ	L22KBLPP20 .. TJ	0.160
Voltage codes, complete the P/N :			Transformer = T1	= T1	
			- 50Hz - 130V / 6V		
			- 60Hz - 110V/120V / 6V		
			Transformer = T2	= T2	
			50Hz - 230V / 6V		
For IP55 degree of protection, add TJ					
Example: L22BLPP20 TJ					



22 Electrical subassemblies for pushbuttons with SMD LEDs - Ø 22 Range

- Metal body - Attachment by punch screws - Connection by double tabs for 6.35 mm clip
- Lighting tier : Receptacle for LED lighting head
- Contact stack : 1 or 2 contacts per tier. (possibility of 3 tiers, 6 contacts, contact us)

Description	Contact	Schematic	Part Number		Weight Kg
			Blue	Other colour	
Electrical subassemblies for pushbuttons illuminated by SMD LED	1NO		Blue	KRH6R .. F2 R1TJ	0.130
			Other colour	KRDRR .. F2 R1TJ	
	1NC		Blue	KRH6R .. F2 1RTJ	0.130
			Other colour	KRHRR .. F2 1RTJ	
	1NO 1NC		Blue	KRH6R .. F2 11TJ	0.140
			Other colour	KRHRR .. F2 11TJ	
	2NO		Blue	KRH6R .. F2 R2TJ	0.140
			Other colour	KRHRR .. F2 R2TJ	
	2NC		Blue	KRH6R .. F2 2RTJ	0.140
			Other colour	KRHRR .. F2 2RTJ	
Voltage code, complete the P/N :			24V = 04		
			48V = 05		
			72V = 06		
For connection by screw and bracket replace F2 by V2					
Example: KRHRR05 V2 2RTJ					



Illuminated latch pushbuttons



22 Electrical subassemblies for pushbuttons with Ø 5mm LEDs - Ø 22 Range

- Metal body - Attachment by punch screws - Connection by double tabs for 6.35 mm clip - Lighting tier : Receptacle for LED lighting head
- Contact stack : 1 or 2 contacts per tier. (possibility of 3 tiers, 6 contacts, contact us)

Description	Contact	Schematic	Part Number	Weight Kg
Electrical subassemblies for pushbuttons illuminated by Ø 5mm LEDs	1NO		Bleu KRG6R .. F2 R1TJ	0.130
			Autre couleur KRGRR .. F2 R1TJ	
	1NC		Bleu KRG6R .. F2 1RTJ	0.130
			Autre couleur KRGRR .. F2 1RTJ	
	1NO 1NC		Bleu KRG6R .. F2 11TJ	0.140
			Autre couleur KRGRR .. F2 11TJ	
	2NO		Bleu KRG6R .. F2 R2TJ	0.140
			Autre couleur KRGRR .. F2 R2TJ	
	2NC		Bleu KRG6R .. F2 2RTJ	0.140
			Autre couleur KRGRR .. F2 2RTJ	



Voltage codes, complete the P/N : 24V = 04

48V = 05

72V = 06

For connection by screw and bracket
replace F2 by **V2**

Example: **KRC6R04 V2 R1TJ**

30 Electrical subassemblies for pushbuttons with SMD LED - Ø 30 Range

- Metal body - Attachment by punch screws - Connection by double tabs for 6.35 mm clip - Lighting tier : Receptacle for LED lighting head
- No polarity - Contact stack : 1 or 2 contacts per tier. (possibility of 3 tiers, 6 contacts, contact us)

Description	Contact	Schematic	Part Number	Weight Kg
Electrical subassemblies for pushbuttons illuminated by SMD LEDs	1NO		LRER2 .. F2 R1TJ	0.130
			LRER3 .. F2 R1TJ	
			LRER4 .. F2 R1TJ	
			LRER5 .. F2 R1TJ	
			LRER6 .. F2 R1TJ	
			LRER9 .. F2 R1TJ	
	1NC		LRER2 .. F2 1RTJ	0.130
			LRER3 .. F2 1RTJ	
			LRER4 .. F2 1RTJ	
			LRER5 .. F2 1RTJ	
			LRER6 .. F2 1RTJ	
			LRER9 .. F2 1RTJ	
	1NO 1NC		LRER2 .. F2 11TJ	0.140
			LRER3 .. F2 11TJ	
			LRER4 .. F2 11TJ	
			LRER5 .. F2 11TJ	
			LRER6 .. F2 11TJ	
			LRER9 .. F2 11TJ	
	2NO		LRER2 .. F2 R2TJ	0.140
			LRER3 .. F2 R2TJ	
			LRER4 .. F2 R2TJ	
			LRER5 .. F2 R2TJ	
			LRER6 .. F2 R2TJ	
			LRER9 .. F2 R2TJ	
	2NC		LRER2 .. F2 2RTJ	0.140
			LRER3 .. F2 2RTJ	
			LRER4 .. F2 2RTJ	
			LRER5 .. F2 2RTJ	
			LRER6 .. F2 2RTJ	
			LRER9 .. F2 2RTJ	



Voltage codes, complete the P/N : 24V = 04

48V = 05

72V = 06

110V = 07

For connection by screw and bracket
replace F2 by **V2**

Example: **LRER205 V2 1RTJ**

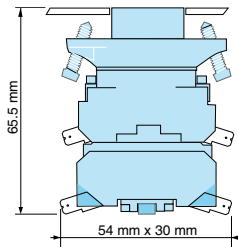
Electrical subassemblies

Dimensions - Cutouts

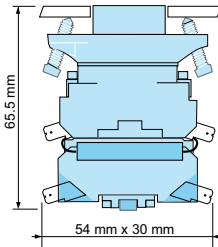
Support thickness : 1 to 6 mm

22 22

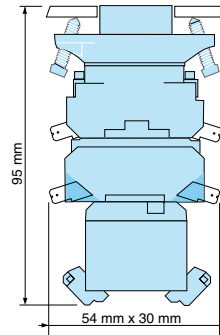
L22BLPP. / L22KBLPP.



L22BLPP.RE / L22KBLPP.RE

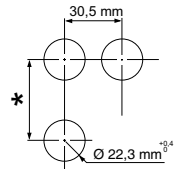
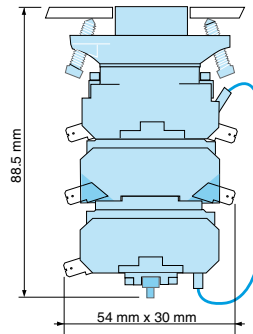


L22BLPP.T. / L22KBLPP.T.



22

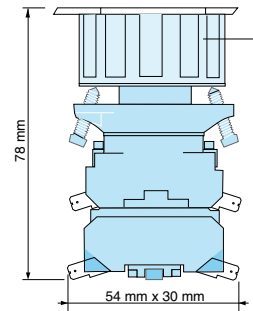
KRH. / KRG.



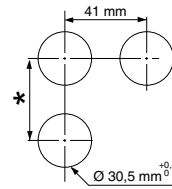
*
90 mm : Tabs 6.35 mm
60 mm : IP2 screw / bracket

30

LRE. / L22KBLPP.



(ring MAL924B1
+ washer EDU750A1)



Rotary switches



Adaptability
Modularity
Safety
Reliability

New contact
blocks

④



⑤



⑥



①



②



③



The range of possibilities :

- ① **Functional and ergonomic button heads**
 - Flush or projecting bezels for Ø22 or Ø30 mm cutouts.
 - With handle, paddle, key, 5-sided key.
 - Metal (with key) or plastic material.
 - 4 standard colours (contact us for other colours).
- ② **Choice of connections**
 - Screws and brackets or washers, IP2 protection.
 - Single or double tabs for 6.35 mm lugs straight, 90°, 45°.
 - (Contact us for other connection types)
 - Tapping for earthing.
- ③ **Contacts**
 - Rotary system with cams.
 - Contact identification per the standards..
- ④ **Modular electrical stack**
 - From 1 to 8 tiers
 - 2 lateral contacts per tier.
 - Provide for a very wide range of electrical schematics.
- ⑤ **Watertight and robust**
 - High mechanical resistance (versions with metal heads)
 - Watertight mechanism : IP66 to IP67 with metal gasket.
 - Tropicalisation.
- ⑥ **Rugged mode of attachment**
 - Moulded metal body.
 - Attachment by punch screws (self-locking, anti rotation) guaranteeing excellent resistance to shock and vibration.

The modular design of MAFELEC's control and signalling components provides for a multitude of combinations and adaptations.

The examples illustrated in this catalogue only represent a fraction of designs produced by our Design Office every day for our customers.

All alternative solutions can be designed from the basic elements, to produce the desired function.



Our equipment complies with the European RoHS directive, restricting the use of certain dangerous substances in electrical equipment.

Compliance with standards

Certification	IEC NF EN 60947-5-1, IEC NF EN 60077-2, cCSA _{US}
Protective finish	Tropicalisation (operating +40°C with 95% humidity) per IEC NF EN 60068-2-3 and IEC NF EN 60068-2-30
Vibration resistance	IEC NF EN 60068-2-6 and IEC NF EN 61373
Storage temperature	- 40°C to + 85°C per IEC NF EN 60068-2-1, IEC NF EN 60068-2-2
Operating temperature	- 25°C to + 70°C per IEC NF EN 60068-2-1, IEC NF EN 60068-2-2
Protection against accidental contact with active circuits	IP2x per IEC NF EN 60529 with protector
Fire resistance	Per NFF 16 101/102
Degree of protection	Per IEC NF EN 60529, IP67 with TJ seal and capped head
Mechanical service life in million switching cycles	0.3

Characteristics of the contact elements

Rated thermal current	l _{th} = 20A per IEC NF EN 60947-5-1
Rated insulation voltage	U _i = 630V per IEC NF EN 60947-5-1 and IEC NF EN 60077-2
Rated surge voltage	6 kV per IEC NF EN 60947-5-1 and IEC NF EN 60077-2
Contact operation type	Slow make depending action
Activation force	From 1 to 4 stacks : 0,5 Nm From 5 to 8 stacks : 0,8 Nm
Contact material	Standard : AgNi Harsh environment : AgPd Low-current : AgPd gold flash
Maximum number of contacts	16 (8 stacks)
Terminal markings	Per IEC NF EN 60947-5-1
Operating power	AC-12 : 230V/15A & 400V/8A AC-15 : 230/8A & 400V/8A DC-12 : 24V/15A & 110V/8A DC-13 : 24V/4A & 110V/1A
Connection	Screw and bracket : min. 1x 0.22 mm ² , max. 2x2.5 mm ² Single or double tab for 6.35 mm clip. Special connection on request

Rotary switches



22 Round heads for rotary switches with paddles or handles : Ø22

- Metal bezel - Plastic levers and handles.

Description	Positions	Colour	Part Number		Weight Kg	
Offset S-type paddle : To fit on 2-position body.		Black	Chrome bezel LSDN	Black bezel LSDNN	0.034	
		Red	LSDR	LSDRN		
Centred S-type paddle		Black	LSN	LSNN	0.034	
		Red	LSR	LSRN		
		Yellow	LSJ	LSJN		
Centred S-type paddle capable of being sealed, contact us		Black	LSN1	LSNN1	0.034	
		Red	LSR1	LSRN1		
		Yellow	LSJ1	LSJN1		
Offset C-type paddle		Black	LCDN	LCDNN	0.036	
		Green	LCDV	LCDVN		
		Red	LCDR	LCDRN		
Centred C-type paddle		Black	LCN	LCNN	0.036	
		Red	LCR	LCRN		
		Yellow	LCJ	LCJN		
Centred C-type paddle capable of being sealed, contact us		Black	LCN1	LCNN1	0.036	
		Red	LCR1	LCRN1		
		Yellow	LCJ1	LCJN1		

DIN and/or High Temperature (120°C) head, on request.

5-sided handle : For use with key P/N : MAK196A0/A2.		Chrome-plated metal	TC5	TC5N	0.034	
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- Head for key selector switch -Bezel and lock in chrome-plated metal - Key No : 455

Description	Positions	Key withdrawn	Part Number	Weight Kg	
Offset handle : To fit on 2-position body.		In position 1	KCEDC R455E 001	0.073	
		In position 2	KCEDC R455E 002		
		In position 1-2	KCEDC R455E 003		
Centred handle : To fit on 3-position body.		In position 8	KCESC R455E 128	0.073	
		In position 1	KCESC R455E 001		
		In position 2	KCESC R455E 002		
		In position 8-1-2	KCESC R455E 131		

Overmoulded key : contact us

Key coding : **R455E** = key No 455E, **R421E** = key No 421E, **R458A** = key No 458A, **3123A** = key No 3123A, **4222E** = key No 4222E

See codifying table page 41

- Key position :

Offset handle :
Two 45° positions

Centred handle :
Four 90° positions

Centred handle :
Eight 45° positions



Rotary switches



30 Round heads for rotary switches with paddles or handles : Ø30

- Metal bezel - Plastic.
- WARNING : ring MAL924A1 + washer EDU750A1 must be added when mounting heads and associated electrical subassemblies

Description	Positions	Colour	Part Number		Weight Kg
			Chrome Bezel	Black Bezel	
Offset S-type paddle : To fit on 2-position body.		Black	L1S1D	L2S1D	0.025
		Red	L1S2D	L2S2D	
		Yellow	L1S4D	L2S4D	
		Grey	L1S8D	L2S8D	
Centred S-type paddle		Black	L1S1N	L2S1N	0.025
		Red	L1S2N	L2S2N	
		Yellow	L1S4N	L2S4N	
		Grey	L1S8N	L2S8N	
Offset C-type paddle : To fit on 2-position body.		Black	L1C1D	L2C1D	0.026
		Red	L1C2D	L2C2D	
		Yellow	L1C4D	L2C4D	
		Grey	L1C8D	L2C8D	
Centred C-type paddle		Black	L1C1N	L2C1N	0,026
		Red	L1C2N	L2C2N	
		Yellow	L1C4N	L2C4N	
		Grey	L1C8N	L2C8N	
Centred C-type paddle capable of being sealed, Contact us.		Black	L1C1N1	L2C1N1	0.027
		Red	L1C2N1	L2C2N1	
		Yellow	L1C4N1	L2C4N1	
		Grey	L1C8N1	L2C8N1	



To order a version with IP66 heads replace the L at the start of the P/N by LE
Example: **LE** 1S1N

DIN and/or High Temperature (120°C) head, on request.

- Head for key selector switch - Metal bezel and lock in chrome-plated steel - Key No : 455
- WARNING : ring DY421F1 must be added when mounting heads and associated electrical subassemblies (see accessories chapter)

Description	Positions	Key withdrawn	Part Number		Weight Kg
			Chrome Bezel	Black Bezel	
Offset lock : To fit on 2-position body		In position 1	LCEDC R455E 001	LCEDN R455E 001	0.078
		In position 2	LCEDC R455E 002	LCEDN R455E 002	
		In position 1-2	LCEDC R455E 003	LCEDN R455E 003	
Centred lock		In position 8	LCESC R455E 128	LCESN R455E 128	0.078
		In position 1	LCESC R455E 001	LCESN R455E 001	
		In position 2	LCESC R455E 002	LCESN R455E 002	
		In position 8-1-2	LCESC R455E 131	LCESN R455E 131	



Overmoulded key : contact us

Key coding : **R455E** = key No 455E, **R421E** = key No 421E, **R458A** = key No 458A, **3123A** = key No 3123A, **4222E** = key No 4222E

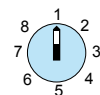
See codifying table page 41

- Key position :

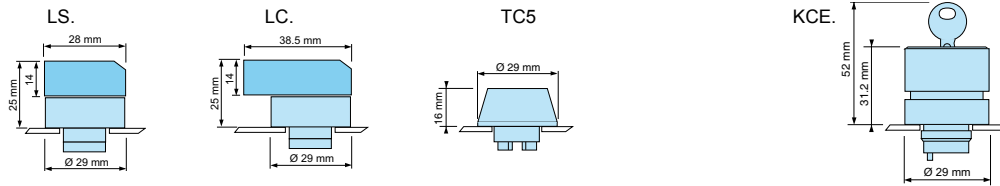
Offset handle :
Two 45° positions

Centred handle :
Four 90° positions

Centred handle :
Eight 45° positions



22 Dimensions of rotary switch heads - Ø22 Range



30 Dimensions of rotary switch heads - Ø30 Range



22 30 Electrical subassemblies for rotary switches

- Metal body - Attachment by punch screws.
- 1 to 8 electrical tiers - (max. 16 contacts) - 2 to 8 positions - *Model opposite : 1 tier*
- Supplied without shunt for series 8900 and 8950
- Connection by double tabs for 6.35 mm clip



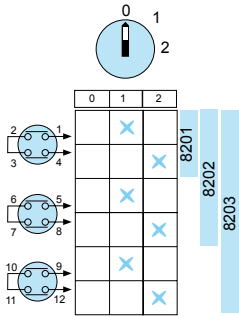
Standardised schematics	Function	Part Number	Weight Kg	
ON/OFF SWITCHES				
2 stable positions				
	1-pole	L228101 TJ	L228101bis TJ	0.081
	2-poles	L228102 TJ	L228102bis TJ	0.088
	3-poles	L228103 TJ	L228103bis TJ	0.107
	etc...		etc...	
	L22 8101/2 F2 etc...		L22 8101/4 F2 etc...	
2 positions 1 with auto-return from right to left				
	1-pole	L228101 RATJ	L228101bis RATJ	0.081
	2-poles	L228102 RATJ	L228102bis RATJ	0.088
	3-poles	L228103 RATJ	L228103bis RATJ	0.107
	4-poles	L228104 RATJ	L228104bis RATJ	0.114
INVERSEURS				
2 stable positions				
	1-pole	Without shunt L22 8951 TJ	With shunt L22 8951 P TJ	0.088
	2-poles	L22 8952 TJ	L22 8952 P TJ	0.115
	3-poles	L22 8953 TJ	L22 8953 P TJ	0.141

For connection by tab for 6.35 mm clip add **F2** at the end of the P/N
Example: L228101 **F2**

Standardised schematics	Function	Part Number	Weight Kg	
	2 positions 1 with auto-return from right to left			
		Without shunt	With shunt	
	1-pole	L228951 RATJ	L22 8951 P RATJ	0.088
	2-poles	L228952 RATJ	L22 8952 P RATJ	0.115
	3-poles	L228953 RATJ	L22 8953 P RATJ	0.141
	3 stable positions with OFF in centre			
		Without shunt	With shunt	
	1-pole	L228901 TJ	L22 8901 P TJ	0.088
	2-poles	L228902 TJ	L22 8902 P TJ	0.115
	3-poles	L228903 TJ	L22 8903 P TJ	0.141
	etc...	etc...		
	L22 8901/4 TJ	etc...		
	3 positions 2 with auto-return to the centre			
		Without shunt	With shunt	
	1-pole	L228901 RATJ	L22 8901 P RATJ	0.088
	2-poles	L228902 RATJ	L22 8902 P RATJ	0.115
	3-poles	L228903 RATJ	L22 8903 P RATJ	0.141
	3 positions 1 with auto-return from left to right			
		Without shunt	With shunt	
	1-pole	L228901 RA1-0TJ	L22 8901 P RA1-0TJ	0.088
	2-poles	L228902 RA1-0TJ	L22 8902 P RA1-0TJ	0.115
	3-poles	L228903 RA1-0TJ	L22 8903 P RA1-0TJ	0.141
	3 positions 1 with auto-return from right to left			
		Without shunt	With shunt	
	1-pole	L228901 RA 2-0TJ	L22 8901 P RA 2-0TJ	0.088
	2-poles	L228902 RA 2-0TJ	L22 8902 P RA 2-0TJ	0.115
	3-poles	L228903 RA 2-0TJ	L22 8903 P RA 2-0TJ	0.141

For connection by tab for 6.35 mm clip add **F2** at the end of the P/N

Standardised schematics



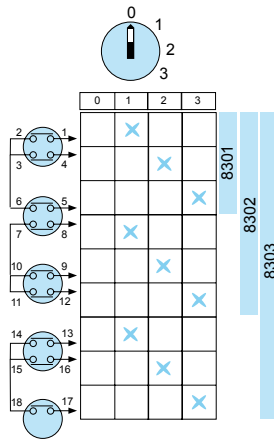
Function

SWITCHES
3 stable positions

Function	Part Number	Weight Kg
1-pole	L22 8201 TJ	0.089
2-poles	L22 8202 TJ	0.116
3-poles	L22 8203 TJ	0.142
etc...		

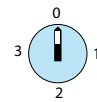


L22 8201/4 TJ
etc...

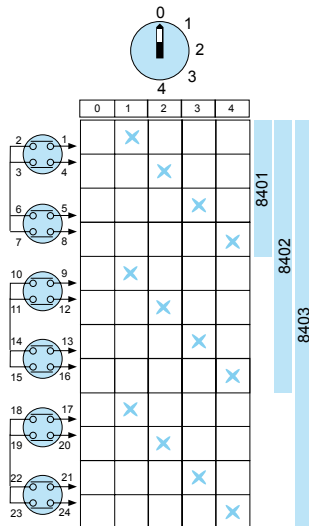


4 stable positions

1-pole	L228301 TJ	0.109
2-poles	L228302 TJ	0.145
3-poles	L228303 TJ	0.192



L22 8301/4 TJ
etc...



5 stable positions

1-pole	L228401 TJ	0.116
2-poles	L228402 TJ	0.173
3-poles	L228403 TJ	0.128

For connection by tab for 6.35 mm clip
add **F2** at the end of the P/N

Example: L22 8401 **F2**

Standardised schematics	Function	Part Number	Weight Kg
	6 stable positions		
	1-pole	L228501 TJ	0.138
	2-poles	L228502 TJ	0.201
	3-poles	L228503 TJ	0.276
	8 stable positions		
	1-pole	L228701 TJ	0.166
	2-poles	L228702 TJ	0.257
	8 stable positions		
	1-pole	L228801 TJ	0.174
	2-poles	L228802 TJ	0.285

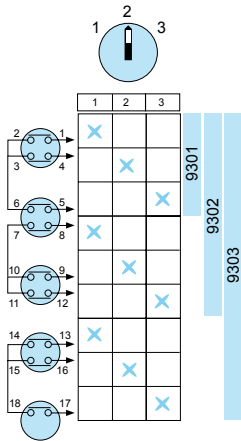
Raccordement par faston double
ajouter F2

Standardised schematics

Function

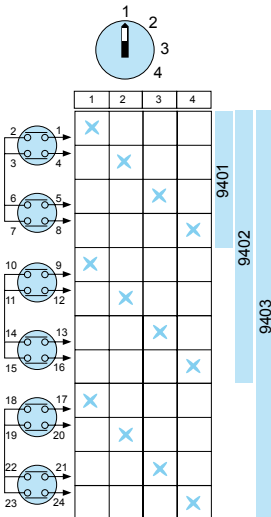
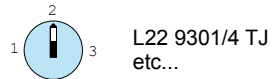
Part Number

Weight Kg



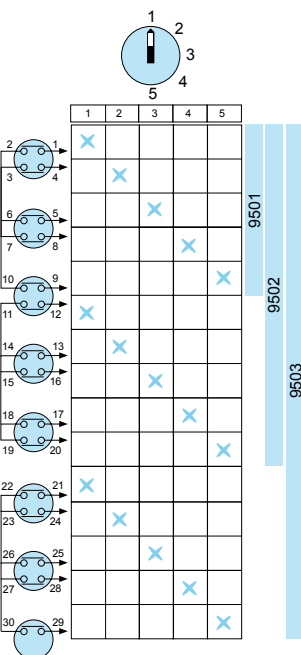
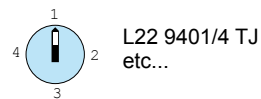
3 stable positions

1-pole	L229301 TJ	0.109
2-poles	L229302 TJ	0.145
3-poles	L229303 TJ	0.192



4 stable positions

1-pole	L229401 TJ	0.116
2-poles	L229402 TJ	0.173
3-poles	L229403 TJ	0.228



5 stable positions

1-pole	L22 9501 TJ	0.128
2-poles	L22 9502 TJ	0.201
3-poles	L22 9503 TJ	0.276

Standardised schematics	Part Number	Weight Kg
	5 stable positions 2-poles L229902 TJ	0.115
VOLTAGE POWER SWITCHES		
	4 stable positions Voltage power switches L229006 TJ	0.115
	L22 9006/4 TJ etc...	
	5 stable positions Voltage power switches L229007 TJ	0.141
	4 stable positions Voltage power switches L229008 TJ	0.115
	7 stable positions Voltage power switches L229008bis TJ	0.115

Rotary switches

22 30

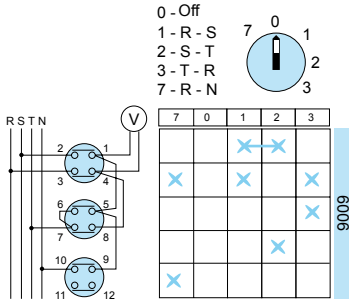
Electrical subassemblies for rotary switches

Standardised schematics

Function

Part Number

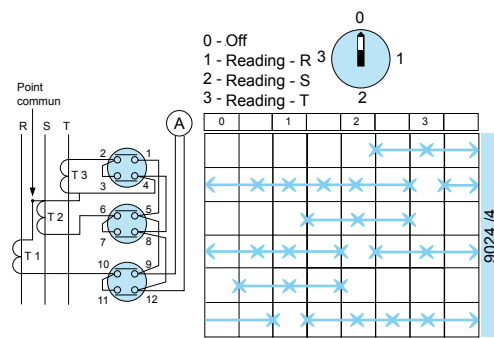
Weight Kg



4 stable positions

L229009 TJ

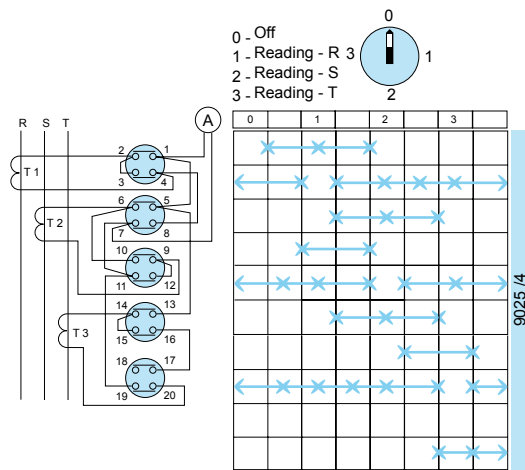
0.141



AMMETER SWITCH
4 stable positions

L229024/4 TJ

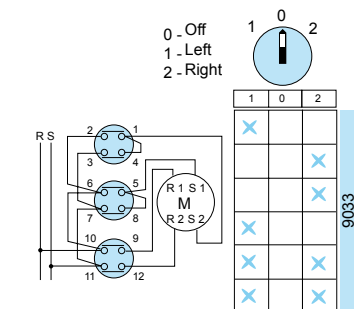
0.141



4 stable positions

L229025/4 TJ

0.201



ROTATION DIRECTION REVERSER
3 stable positions

L229033 TJ

0.141

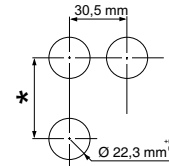
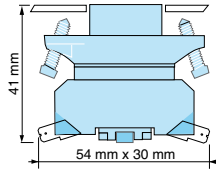
For connection by tab for 6.35 mm clip
add **F2** at the end of the P/N
Example: L229009 **F2**

22 30 Electrical subassemblies for rotary switches

Dimensions - Cutouts

Add 16 mm to the height for additional contact tier
Support thickness : 1 to 6 mm

22

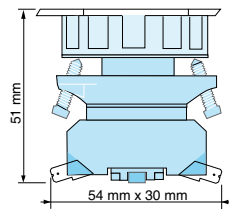


* 90 mm : Tabs 6.35 mm
60 mm : IP2 screw / bracket

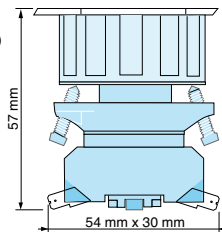
30

For paddle and handle

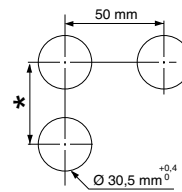
With key



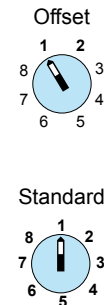
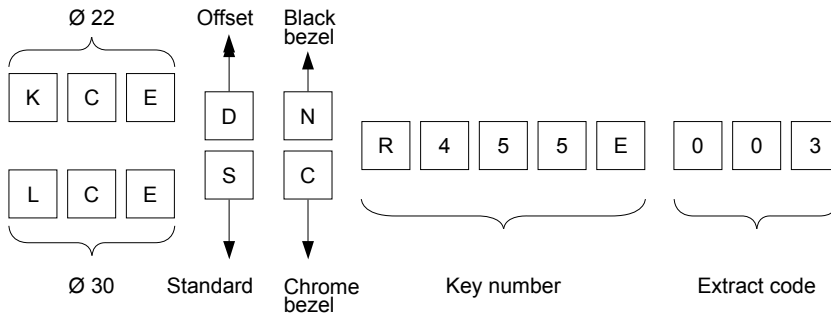
(ring MAL924B1 + washer EDU750A1)



(ring MAL924B1 + washer EDU750E1)



Codification : Head for key selector switch



Codification of keys number : **R455E** = clé n°455E, **R421E** = clé n°421E, **R458A** = clé n°458A, **3123A** = clé n°3123A, **4222E** = clé n°4222E

Creating extract code :

The extract code is defined by the sum of the values according to the extract required.
If the sum is less than 3 characters, add 0 in front.

Extract	Value
1	1
2	2
3	4
4	8
5	16
6	32
7	64
8	128

Eg : Extract in 1-3-5-7
Sum = 1+4+16+64=85
Extract code = 085

The most used extract codes :

Extract	Code
Extract in 1	001
Extract in 2	002
Extracts in 1 et 2	003
Extract in 8	128
Extracts in 8-1-2	131
Extracts in 8-1	129
Extracts in 1-3-5-7	085
Extracts in 7-1-3	069
Extracts in 1-2-3-4-5-6-7-8	255

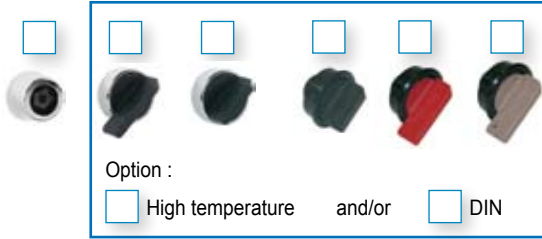


Rotary switches



Definition chart

1- Check the type of head



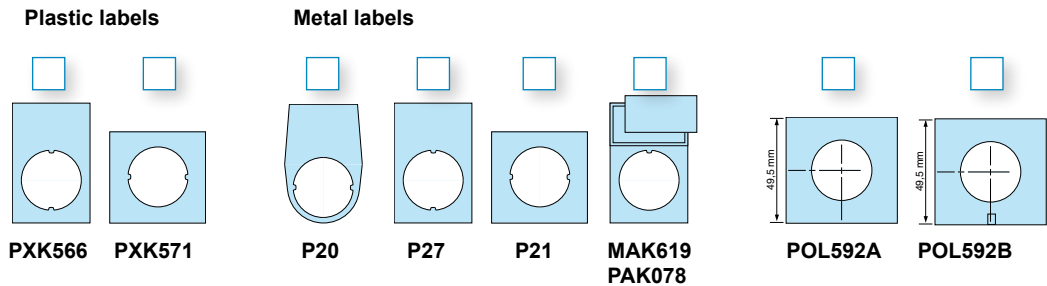
Key No :
 Position(s) for key withdrawal :

Option :
 Overmoulded key

2- Check the colour of the head

Black Green Yellow

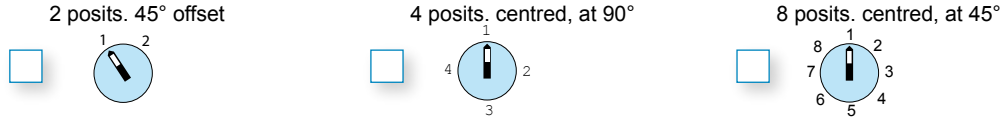
3- Check the type of label if required



4- Check the label colour

Black label white engraving
 Grey label black engraving
 White label black engraving
 Red label white engraving
 Green label white engraving
 Yellow label white engraving

5- Check the type of mechanism and specify any auto-returns if required



6- Check the type of contacts

Silver / Palladium
 Silver / Nickel
 Gold flash

7- Type of selector

Strike out the unused mechanism positions

Complete the chart opposite using the symbol "X" for a closed contact and "X---X" for contacts which overlap two positions



Max. 16 contacts for selector switches

Electrical Diagram for selector switch

		Mechanism and position							
		90°	1	2	3	4	5	6	7
Tier 1	Contact 2 ___ 1								
	Contact 3 ___ 4								
Tier 2	Contact 6 ___ 5								
	Contact 7 ___ 8								
Tier 3	Contact 10 ___ 9								
	Contact 11 ___ 12								
Tier 4	Contact 14 ___ 13								
	Contact 15 ___ 16								
Tier 5	Contact 18 ___ 17								
	Contact 19 ___ 20								
Tier 6	Contact 22 ___ 21								
	Contact 23 ___ 24								
Tier 7	Contact 26 ___ 25								
	Contact 27 ___ 28								
Tier 8	Contact 30 ___ 29								
	Contact 31 ___ 32								

8- Specify the engraving for the label if required

Position	Engraving
1	
2	
3	
4	
5	
6	
7	
8	

9- Type of connection

- IP2x screw and bracket
- Screw and bracket
- Double tabs for 6.35 mm clip
- Straight tab at 90° for 6.35 mm clip

10- Protection

IP40 IP55 IP65

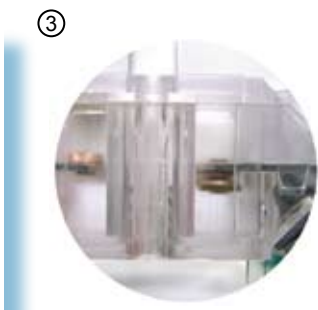
Emergency STOP



EN418

Protection of
people and
machinery

New contact
blocks



Equipment complying with European Standard **EN 418**, relating to safety devices.

The range of possibilities :

- ① **Heads for all applications**
 - Ø 30, Ø 40, Ø 70
 - Black or chrom-plated bezels.
- ② **Choice of connections**
 - Screws and brackets or washers, IP2 protection.
 - Single or double tabs for 6.35 mm lugs straight, 90°, 45°.
 - (Contact us for other connection types)
 - Tapping for earthing.
- ③ **Flexibility and accuracy in the contact solutions**
 - Self cleaning, reinforced contacts.
 - Choice of the contact material depending on the utilisation: low current, harsh atmosphere ...
 - Possibility of modifying the contact sequence using different contact thickness: standard, half-thickness, thick.
- ④ **An ultra-modular electric stack**
 - From 1 to 2 lateral contact per tier.
 - 1NC, 1NC1NO, 2NC, 2NC2NO.
 - Contact identification per standards
 - From 1 to 2 tiers (or more, contact us).
- ⑤ **Watertight and robust**
 - High mechanical resistance 100 000 manoeuvres
 - Sealing levels : IP65, IPx7 (submergence 1m / 30mn) and IP69K (100 b pressure /30 s all directions)
 - Tropicalisation.
- ⑥ **Rugged mode of attachment**
 - Moulded metal body, attachment by punch screws, guaranteeing excellent resistance to shock and vibration.
 - Contact tiers screwed
 - Tapping for earthing

The modular design of MAFELEC's control and signalling components provides for a multitude of combinations and adaptations.

The examples illustrated in this catalogue only represent a fraction of designs produced by our Design Office every day for our customers.

All alternative solutions can be designed from the basic elements, to produce the desired function.



Emergency STOP

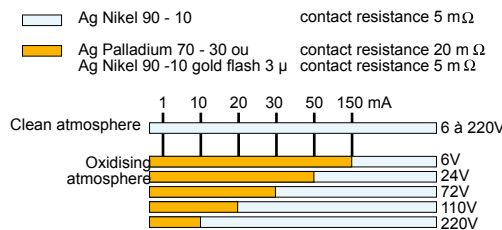


Compliance with Emergency STOP Standards

Certification	EN 418 / ISO 13850 : so-called «tamper-proof» system, positive contacts opening, special electrical stack Heads comply RoHS directive 2002/95/EC
Vibration resistance	Per IEC NF EN 6068-2-6 : 5gn, 10 to 500 Hz
Shock resistance	IK10 per IEC NF EN 62 262
Storage temperature	- 40°C to + 85°C per IEC NF EN 60068-2-1, IEC NF EN 60068-2-2
Operating temperature	- 25°C to + 70°C per IEC NF EN 60068-2-1, IEC NF EN 60068-2-2
Fire resistance	V2 per UL standard
Protection against accidental contact witch active circuits	IP2x per IEC NF EN 60529 with protector
Degree of protection	IP65, IP67 and IP69K depending on the model and per IEC NF EN 60529

Characteristics of the contact elements

Rated thermal current	I _{th} = 20A per IEC NF EN 60947-5-1
Rated insulation voltage	U _i = 6300V per IEC NF EN 60947-5-1 and IEC NF EN 60077-2
Rated surge voltage	6 kV per IEC NF EN 60947-5-1 and IEC NF EN 60077-2
Contact operation type	Slow make depending action
Activation force	Push button : 1NC = 8N, 1NO = 10N, 2NC = 13N, 2NO = 13N
Contact material	Standard : AgNi Harsh environment : AgPd Low-current : AgPd gold flash



Maximum number of contacts	4 (2 stacks). For more contacts, contact us
Terminal markings	Per IEC NF EN 60947-5-1
Operating power	AC-12 : 230V/15A & 400V/8A AC-15 : 230/8A & 400V/8A DC-12 : 24V/15A & 110V/8A DC-13 : 24V/4A & 110V/1A
Connection	Screw and bracket : min. 1x 0.22 mm ² , max. 2x2.5 mm ² Single or double tab for 6.35 mm clip. Special connection on request

Emergency STOP pushbuttons



22 Emergency STOP pushbuttons - Complete units - Ø 22 Range

- Metal bezel - Plastic button - Attachment by punch screws - 1 or 2 contacts per tier - Connection by IP2x screw / bracket

Description	Contact	Schematic	Part Number			
			Chrome bezel	Black Bezel		
Pull-push E-stop Ø 30 button IP65	1NC		D22Z301OL RT	D22N301OL RT	0.140	
	1NO 1NC		D22Z301O1FL RT	D22N301O1FL RT	0.145	
	2NC		D22Z302OL RT	D22N302OL RT	0.140	
	2NO 2NC		D22Z302O2FL RT	D22N302O2FL RT	0.145	
Pull-push E-stop Ø 40 button IP65	1NC		D22Z401OL RT	D22N401OL RT	0.150	
	1NO 1NC		D22Z401O1FL RT	D22N401O1FL RT	0.155	
	2NC		D22Z402OL RT	D22N402OL RT	0.150	
	2NO 2NC		D22Z402O2FL RT	D22N402O2FL RT	0.155	
Pull-push E-stop Ø 70 button IP65	1NC		D22Z701OL RT	D22N701OL RT	0.150	
	1NO 1NC		D22Z701O1FL RT	D22N701O1FL RT	0.155	
	2NC		D22Z702OL RT	D22N702OL RT	0.150	
	2NO 2NC		D22Z702O2FL RT	D22N702O2FL RT	0.155	

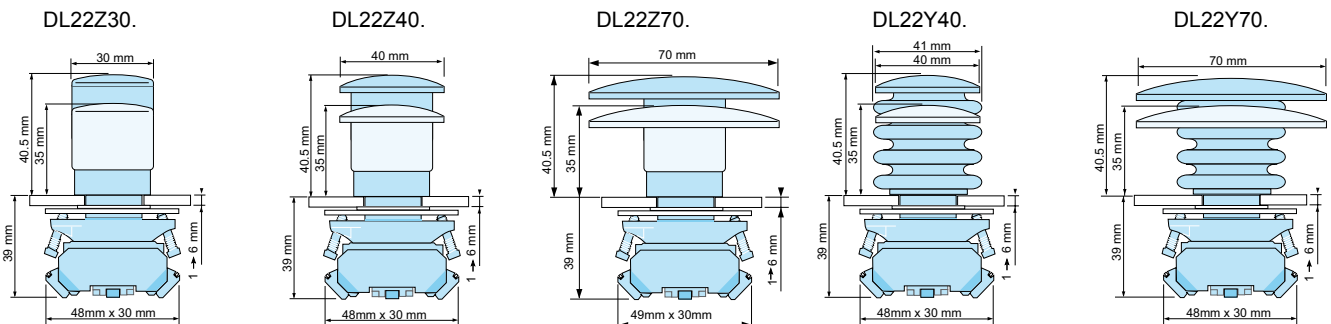
Watertight versions

Description	Contact	Schematic	Part Number			
			IP 67 - IP 69K	IP 66		
Pull-push E-stop Ø 40 button With bellows	1NC		D22Y401OL JT	DL22Y401OL JR	0.160	
	1NO 1NC		D22Y401O1FL JT	DL22Y401O1FL JR	0.165	
	2NC		D22Y402OL JT	D22Y402OL JR	0.160	
	2NO 2NC		D22Y402O2FL JT	D22Y402O2FL JR	0.165	
Pull-push E-stop Ø 70 button With bellows	1NC		D22Y701OL JT	D22Y701OL JR	0.165	
	1NO 1NC		D22Y701O1FL JT	D22Y701O1FL JR	0.170	
	2NC		D22Y702OL JT	DL22Y702OL JR	0.165	
	2NO 2NC		D22Y702O2FL JT	D22Y702O2FL JR	0.170	

For connection by double 6.35 tab, replace V2 by F2 at the end of P/N

Example: **L22Y702O2FL F2 JT**

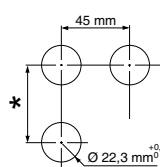
Dimensions - Cutouts



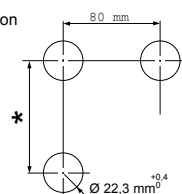
Add 16 mm to the height (39 mm) for every additional contact tier

Support thickness : 1 to 6 mm

Ø 30 / 40 button



Ø 70 button



* 90 mm : Tabs 6.35 mm
60 mm : IP2 screw / bracket

Joysticks



Adaptability
Modularity
Safety
Reliability

New contact blocks



The range of possibilities :

- ① **Multiple functions**
 - 1 to 4 directions.
 - 1 or 2 speeds per direction.
 - 1 to 2 tiers (1 to 4 contacts) per direction
1NO, 1NC, 1NC1NO, 2NC, 2NO.
 - Contact identification per standards, colour code
(green for NO, red for NC)
 - Stable or auto-return positions.
- ② **Flexibility and accuracy in the contact solutions**
 - Self cleaning, reinforced contacts.
 - Choice of the contact material depending on the utilisation:
low current, harsh atmosphere ...
 - Possibility of modifying the contact sequence using different
contact thickness: standard, half-thickness, thick.
 - Addition of a specific module (early breaking, tactile sensation)
- ③ **Choice of connections**
 - Screws and brackets or washers, IP2 projection.
 - Single or double tabs for 6,35 mm lugs.
 - Straight, 90°, 45°.
(Contact us for other connection types)
- ④ **Choice of dimensions**
 - Numerous options for levers and grips
provide for varying the dimension of the manoeuvring
device according to the space available or to the
desired ergonomics.
- ⑤ **A robust device**
 - High mechanical resistance.- IP66 protection
 - Sealing IP66
 - Very low temperature versions.

The modular design of MAFELEC's control and signalling components provides for a multitude of combinations and adaptations. The examples illustrated in this catalogue only represent a fraction of designs produced by our Design Office every day for our customers.

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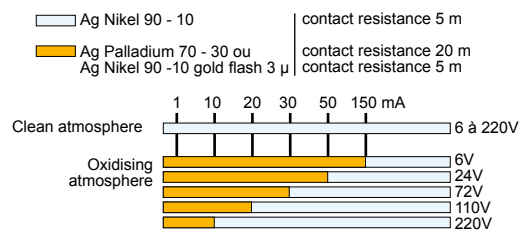
Our equipment complies with the European RoHS directive, restricting the use of certain dangerous substances in electrical equipment.

Compliance with Standards

Certification	IEC NF EN 60947-5-1, IEC NF EN 60077-2, cCSA _{US}
Vibration resistance and shock	IEC NF EN 61373, IEC NF EN 60068-2-6
Storage temperature	- 40°C to + 85°C per IEC NF EN 60068-2-1, IEC NF EN 60068-2-2
Operating temperature	- 25°C to + 70°C per IEC NF EN 60068-2-1, IEC NF EN 60068-2-2
Protection against accidental contact with active circuits	IP2x per IEC NF EN 60529 with protector
Fire resistance	Per NFF 16 101/102
Degree of protection	IP66 per IEC NF EN 60529
Mechanical service life in millions of switching operations	0.05 Specific product: 0.2

Characteristics of the contact elements

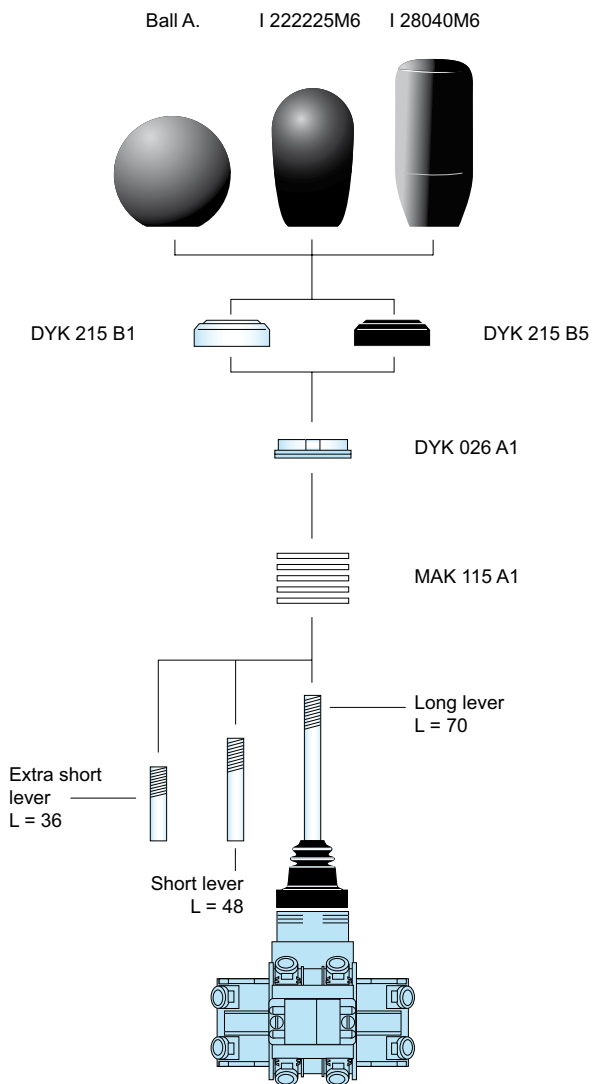
Rated thermal current	I _{th} = 20A per IEC NF EN 60947-5-1
Rated insulation voltage	U _i = 630V per IEC NF EN 60947-5-1 and IEC NF EN 60077-2
Rated surge voltage	6 kV per IEC NF EN 60947-5-1 and IEC NF EN 60077-2
Contact operation type	Slow make depending action
Activation force	Push button : 1NC = 8N, 1NO = 10N, 2NC = 13N, 2NO = 13N
Contact material	Standard : AgNi Harsh environment : AgPd Low-current : AgPd gold flash



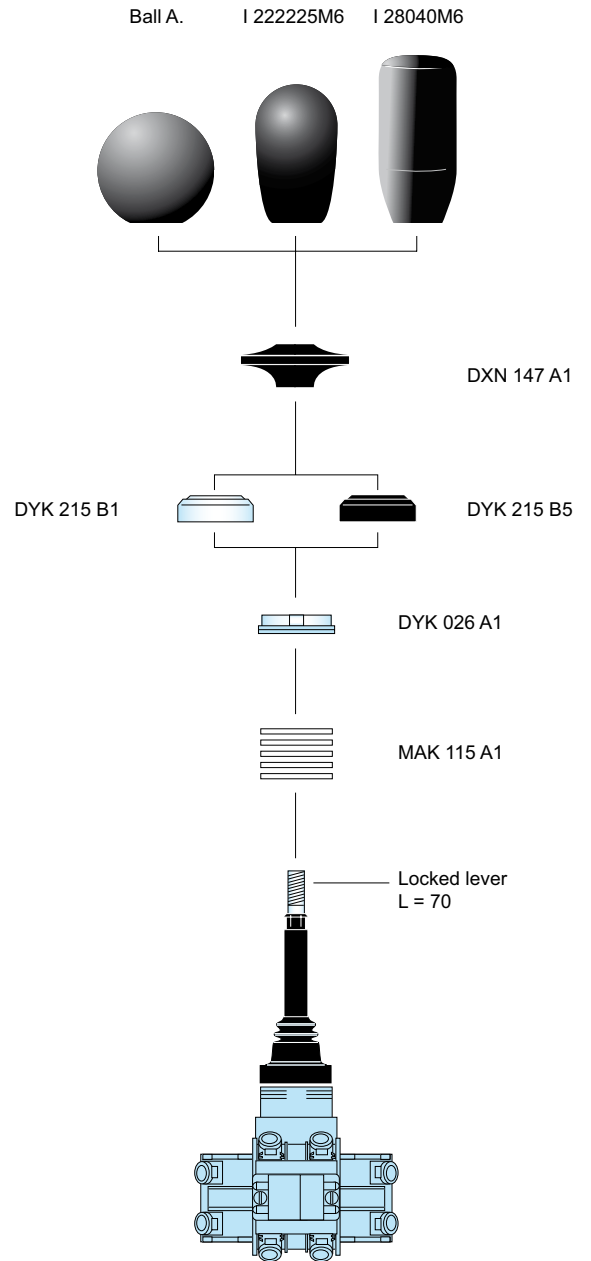
Maximum number of contacts	4 (2 stacks) by side
Terminal markings	Per IEC NF EN 60947-5-1
Operating power	AC-12 : 230V/15A & 400V/8A AC-15 : 230/8A & 400V/8A DC-12 : 24V/15A & 110V/8A DC-13 : 24V/4A & 110V/1A
Connection	Screw and bracket : min. 1x 0.22 mm ² , max. 2x2.5 mm ² Single or double tab for 6.35 mm clip. Special connection on request

22 Joysticks - Presentation

- Joystick Ø 22





- Joystick Ø 22 with central position locks

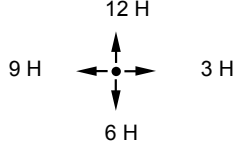
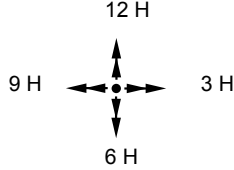


NOTA : The rings to lock (ref YSK 8073 ou DXN 147 A1) of joystick aire delivered disassembled for the mounting, and must be correctly fixed after the assemblage of this one.

22 Joysticks - P/N codification

	A	B1	B2	B3	B4	C1	C2	C3	C4	D
		12 H	3 H	6 H	9 H	12 H	3 H	6 H	9H	
L22M										
Joystick range	Ball grip See table 1	Mechanical part See table 2				Electrical part See table 3				Connection type See table 4

1 - Ball grip	
Complete the box in column A indicating the lever code.	
Length 54 mm with ball Ø 15 x 25 mm (**) extra short, brilliant bezel extra short, black bezel extra short, very low temperature, brilliant bezel extra short, very low temperature, black bezel	 Code C CN Y YN
Length 66 mm with ball Ø 15 x 25 mm (*) short, brilliant short, black short, brilliant, very low temperature short, black, very low temperature	Code M N X S
Length 88 mm with ball Ø 15 x 25 mm (*) long, brilliant long, black long, brilliant, very low temperature long, inox, very low temperature long, black, very low temperature	Code L P W AA R
Length 93 mm with ball Ø 15 x 25 mm (*) locked, brilliant locked, watertight brilliant	Code V O
Length 54 mm with handle Ø 18 x 40 mm (**) extra short, brilliant bezel extra short, black bezel extra short, very low temperature, brilliant bezel extra short, very low temperature, black bezel	 Code D DN I IN
Length 66mm with handle Ø 18 x 40 mm (*) short, brilliant short, black short, brilliant, very low temperature short, black, very low temperature	Code B F H K
Length 88 mm with handle Ø 18 x 40 mm (*) long, brilliant long, black long, brilliant, very low temperature long, black, very low temperature	Code A J G U
Length 108 mm with handle Ø 18 x 40 mm (*) lock, brilliant lock, watertight brilliant	Code E Q

2 - Mechanical part					
Complete the box in columns B1 B2 B3 B4 indicating the code of the mechanical part for each direction.					
					
1 position per direction automatic return : RA stable position : PM	Code 1 2				
					
2 positions per direction automatic return + automatic return : RA + RA stable position + stable position : PM + PM stable position + automatic return : PM + RA position prohibited	Code 3 4 5 0				
3 - Electrical part					
Complete the box in columns C1 C2 C3 indicating the code of electrical contacts. In the case of a direction with 2 positions, "2F" (2F in the first position and 2 other contact 2F in the second position) means : 1 position per direction = 4 contacts max. per direction 2 positions per direction = 2 contacts max. per position					
Contact	Code	Contact	Code	Contact	Code
1O	A	1O 2F	F	3O 1F	K
1F	B	2O 1F	G	2O 2F	L
1O 1F	C	3O	H	4O	M
2O	D	3F	I	4F	N
2F	E	1O 3F	J	sans	R
1F + 1F	P	1F + 1F + OA	Q		
4 - Connection					
Complete the box in column D					
Screw and bracket with IP2X Screw and bracket without IP2X Double tabs for clips of 6.35 mm	Code without V F2				

(*)Standard :

For short or long lever : brilliant lever = brilliant bezel; black lever = black bezel; Other, contact us or use definition chart page 54.

(**) For ultra short lever, The lever is already brilliant (it is hidden under the bellows), the bezel give the color.

Standard Joysticks



22 Joysticks - Complete units - Ø 22 Range

- Chrome metal bezel - Central attachment by nut
- 1 or 2 contacts per tier - Connection by IP2x screw / bracket

Description	Contact	Direction	Part Number	Weight Kg
1-direction joysticks				
Lever + ball grip L = 88 mm :				
1 stable position	1NO / pos.	↑	L22ML2000BRRRV2	0.195
	1NO + 1NC / pos.		L22ML2000CRRRV2	0.200
	2NO / pos.		L22ML2000ERRRV2	0.200
1 position with automatic return to the centre	1NO / pos.	↑	L22ML1000BRRRV2	0.195
	1NO + 1NC / pos.		L22ML1000CRRRV2	0.200
	2NO / pos.		L22ML1000ERRRV2	0.200
2-direction joysticks				
Lever + ball grip L = 88 mm :				
1 stable position per direction	1NO / pos.	←•→	L22ML2020BRBRV2	0.220
	1NO + 1NC / pos.		L22ML2020CRCRV2	0.235
	2NO / pos.		L22ML2020ERERV2	0.235
1 position with automatic return to the centre per direction	1NO / pos.	←•→	L22ML1010BRBRV2	0.220
	1NO + 1NC / pos.		L22ML1010CRCRV2	0.235
	2NO / pos.		L22ML1010ERERV2	0.235
Lever + ball grip L = 66 mm :				
1 stable position per direction	1NO / pos.	←•→	L22MM2020BRBRV2	0.220
	1NO + 1NC / pos.		L22MM2020CRCRV2	0.235
	2NO / pos.		L22MM2020ERERV2	0.235
1 position with automatic return to the centre per direction	1NO / pos.	←•→	L22MM1010BRBRV2	0.220
	1NO + 1NC / pos.		L22MM1010CRCRV2	0.235
	2NO / pos.		L22MM1010ERERV2	0.235
3-direction joysticks				
Lever + ball grip L = 88 mm :				
1 stable position and 2 x 1 position with automatic return to the centre	1NO / pos.		L22ML1012BRBBV2	0.240
	1NO + 1NC / pos.		L22ML1012CRCCV2	0.255
	2NO / pos.		L22ML1012EREEV2	0.255
4-direction joysticks				
Lever + ball grip L = 88 mm :				
1 stable position per direction	1NO / pos.		L22ML2222BBBBV2	0.265
	1NO + 1NC / pos.		L22ML2222CCCCV2	0.280
	2NO / pos.		L22ML2222EEEEV2	0.280
1 position with automatic return to the centre per direction	1NC / pos.		L22ML1111BBBBV2	0.265
	1NO + 1NC / pos.		L22ML1111CCCCV2	0.280
	2NC / pos.		L22ML1111EEEEV2	0.280
Lever + ball grip L = 66 mm :				
1 stable position per direction	1NC / pos.		L22MM2222BBBBV2	0.265
	1NO + 1NC / pos.		L22MM2222CCCCV2	0.280
	2NC / pos.		L22MM2222EEEEV2	0.280
1 position with automatic return to the centre per direction	1NC / pos.		L22MM1111BBBBV2	0.265
	1NO + 1NC / pos.		L22MM1111CCCCV2	0.280
	2NC / pos.		L22MM1111EEEEV2	0.280



Connection by tab 6.35mm
add F2 at the end of the P/N
Example: L22MM1010ERER **F2**

Locking joysticks



22 Joysticks - Complete units - Ø 22 Range

- The central position of joystick locks automatically (prevents involuntary) - Chrome metal bezel - Central attachment by nut
- 1 or 2 contacts per tier - Connection by IP2x screw / bracket

Description	Contact	Direction	Part Number	Weight Kg
2-direction joysticks				
Lever + ball grip L = 88 mm :				
1 position with automatic return to the centre per direction	1NO / pos.	←•→	L22MV1010BRBRV2	0.220
	1NO + 1NC / pos.		L22MV1010CRCRV2	0.235
	2NO / pos.		L22MV1010ERERV2	0.235
1 stable position per direction	1NO / pos.	←•→	L22MV2020BRBRV2	0.195
	1NO + 1NC / pos.		L22MV2020CRCRV2	0.200
	2NO / pos.		L22MV2020ERERV2	0.200
2 positions with automatic return to the centre per direction	1NO / pos.	←•••→	L22MV3030BRBRV2	0.330
	1NO + 1NC / pos.		L22MV3030CRCRV2	0.345
	2NO / pos.		L22MV3030ERERV2	0.345



4-direction joysticks

Lever + ball grip L = 88 mm :

1 position with automatic return to the centre per direction	1NO / pos.	↑•↓	L22MV1111BBBBV2	0.265
	1NO + 1NC / pos.		L22MV1111CCCCV2	0.280
	2NO / pos.		L22MV1111EEEEV2	0.280
1 stable position per direction	1NO / pos.	↑•↓	L22MV2222BBBBV2	0.265
	1NO + 1NC / pos.		L22MV2222CCCCV2	0.280
	2NO / pos.		L22MV2222EEEEV2	0.280
2 positions with automatic return to the centre per direction	1NO / pos.	↑•↓	L22MV3333BBBBV2	0.380
	1NO + 1NC / pos.		L22MV3333CCCCV2	0.410
	2NO / pos.		L22MV3333EEEEV2	0.410

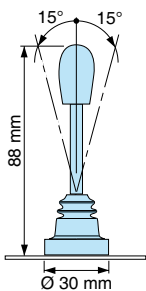


Connection by tabs 6.35mm
add F2 at the end of the P/N
Example: L22MV2222EEEE F2

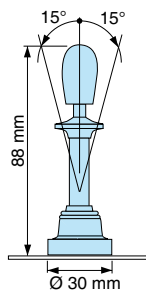
Dimensions - Cutouts

Support thickness : 1 to 6 mm

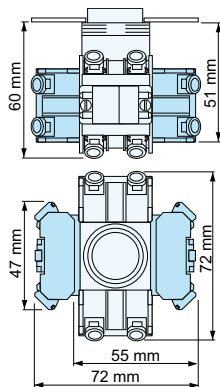
Standard lever



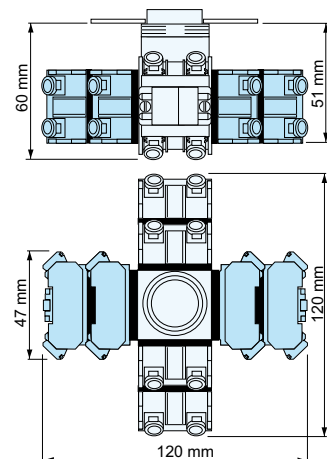
Locking lever



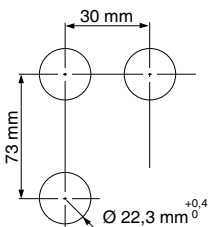
1,2,3 or 4 directions
1 position per direction



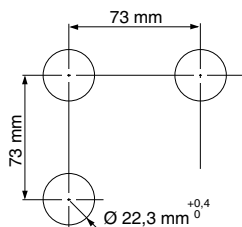
2 or 4 directions
2 positions per direction



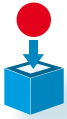
Drilling templates for
2-direction joysticks;
1 position per direction



Drilling templates for
4-direction joysticks;
1 position per direction

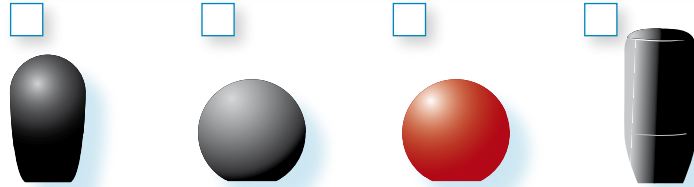


*** WARNING !**
For joysticks with 2 positions per direction,
the 73 mm dimension becomes 122 mm.

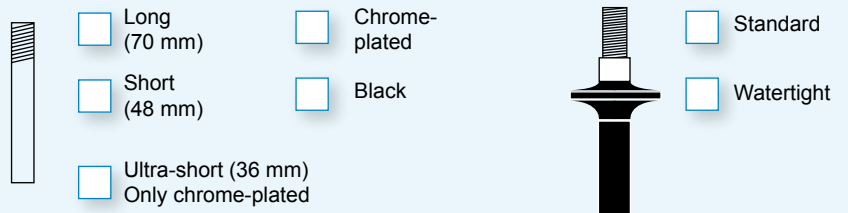


Definition chart

1- Check the ball grip



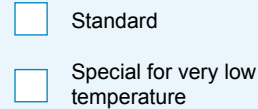
2- Check the type of lever



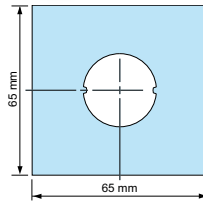
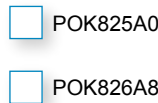
3- Check the bezel colour



4- Check the type of bellows



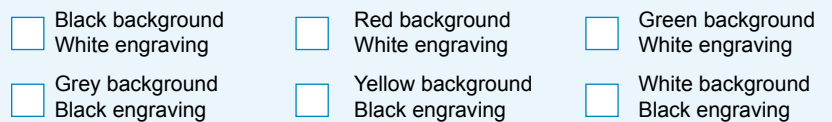
5- Check the label, if required



6- Specify the label engraving if required

Position	Engraving
12h	
3h	
6h	
9h	

7- Check the label colour



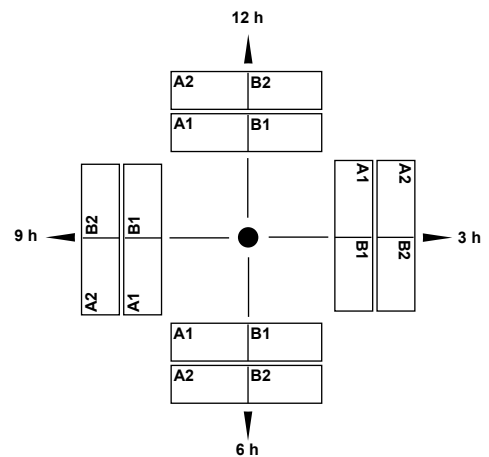
8- Complete the mechanical and electrical diagram



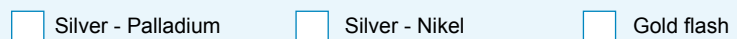
1 position per direction = max. 4 contacts
2 positions per direction = max. 2 contacts per direction

Box A. (mechanical part)
1 position use A1
2 positions use A1 and A2
Mark the box
PM: for stable position
RA: for automatic return to the centre

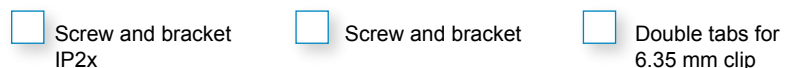
Box B. (electrical part)
1 position use B1
2 positions use B1 et B2
Mark the type of contact in the box
(1NO - 1NC - 1NO1NC - 2NO - 2NC)



9- Check the type of contact



10- Check the connection type



Spécial units



④



①



②



③



⑤



Mafelec, the specialist in adapted control.

Specific control components to customer specification.

The range of possibilities :

- ① **Multi directional switches**
- Contact is ensured in all positions
- ② **Toggle switches**
- Switches with cam followers
- ③ **Interlocked buttons**
- Safe control
- ④ **Foot control**
- Hands-free control
- ⑤ **Accessories**
- Range of mounting, safety, sealing and labelling for control components.



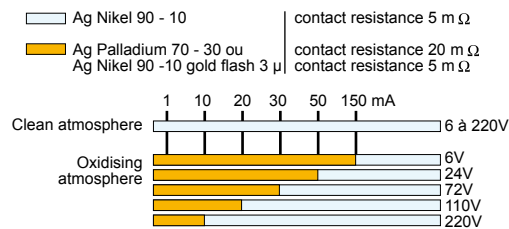
Our equipment complies with the European RoHS directive, restricting the use of certain dangerous substances in electrical equipment.

Compliance with Standards

Certification	IEC NF 60947-5-1, IEC NF EN 60077-2, cCSA _{US}
Protective finish	Tropicalisation (operating +40°C with 95% humidity) per IEC NF EN 60068-2-3, IEC NF EN 60068-2-30
Vibration resistance	IEC NF EN 61373, IEC NF EN 60068-2-6
Storage temperature	- 40°C to + 85°C per IEC NF EN 60068-2-1, IEC NF EN 60068-2-2
Operating temperature	- 25°C to + 70°C per IEC NF EN 60068-2-1, IEC NF EN 60068-2-2
Protection against accidental contact with active circuits	IP2x as per IEC NF EN 60529
Fire resistance	Per NF F 16-101/102
Degree of protection	Per IEC NF EN 60529 : IP40 without seal, IP66 with TJ seal and capped head
Mechanical service life in millions of switching operations	Momentary pushbutton : 1 Joystick circuit breaker : 1 Interlocked pushbutton : 1

Characteristics of the contact elements

Rated thermal current	I _{th} = 20A per IEC NF EN 60947-5-1
Rated insulation voltage	U _i = 630V per IEC NF EN 60947-5-1 and IEC NF EN 60077-2
Rated surge voltage	6 kV per IEC NF EN 60947-5-1 and IEC NF EN 60077-2
Contact operation type	Slow make depending action
Activation force	Pushbuttons: 1NC = 8N, 1NO = 10N, 2NC = 13N, 2NO = 13N
Contact material	Standard : AgNi Harsh environment : AgPd Low-current : AgPd gold flash



Maximum number of contacts	Pushbuttons : - Momentary: 8 - Push-push: 4 - Push-pull: 4 - Illuminated: 6
Terminal markings	Per IEC NF EN 60947-5-1
Operating power	AC-12 : 230V/15A & 400V/8A AC-15 : 230/8A & 400V/8A DC-12 : 24V/15A & 110V/8A DC-13 : 24V/4A & 110V/1A
Connection	Screw and bracket : min. 1x 0.22 mm ² , max. 2x2.5 mm ² Single or double tab for 6.35 mm clip. Special connection on request

Multi-directional switch



22 Multi-directional switch - Complete units - Ø 22 Range

- Multi-directional actuation - Black metal bezel - Central attachment by nut - 1 or 2 contacts per tier
- Connection by tabs for 6.35 mm clip - Single contact bloc triggered in any direction.

Description	Contact	Direction	Part Number	Weight Kg
Multi-directional actuator	1NC		L22RT10TJ	0.145
	1NO		L22RT1FTJ	0.145
	1NO1NC		L22RT1O1FTJ	0.150
	2NC		L22RT2OTJ	0.160
	2NC		L22RT2FTJ	0.160
	2NO2NC		L22RT2O2FTJ	0.185
	3NO3NC		L22RT3O3FTJ	0.210

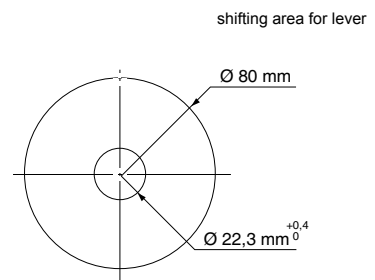
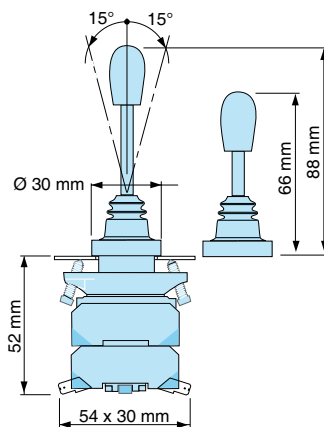


Connection by tab 6.35mm
add **F2** at the end of the P/N
Example: **L22RT2F F2**

Dimensions - Cutouts

Support thickness : 1 to 6 mm

Add 16 mm to the 52 mm dimension for every additional electrical tier.



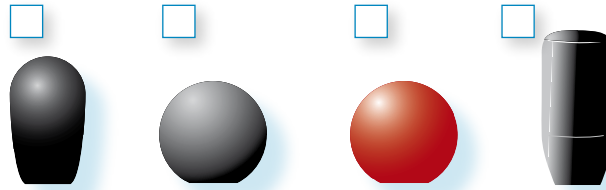


Multi-directional switch



Definition chart

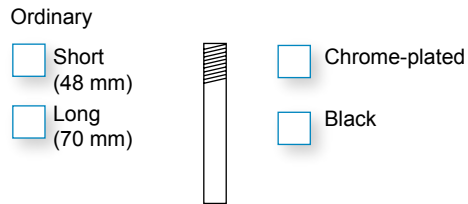
1- Check the ball grip



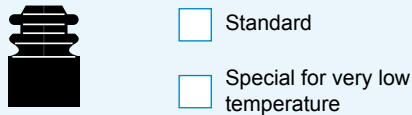
2- Check the bezel colour



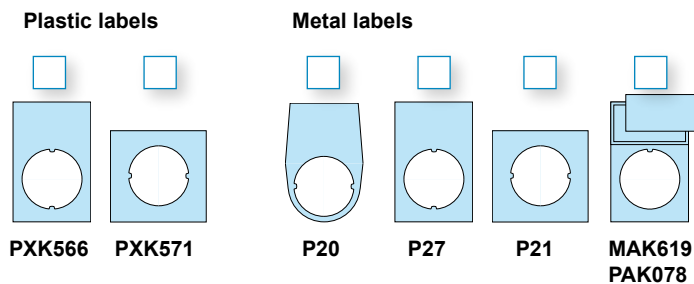
3- Check the type of lever



4- Check the type of bellows

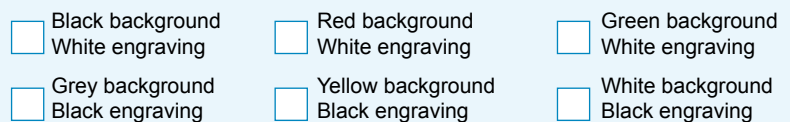


5- Check the label if required

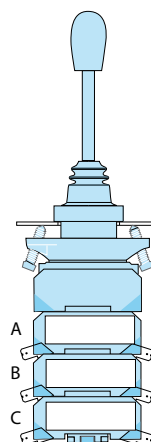


6- Specify the engraving for the label, if required

7- Check the label colour

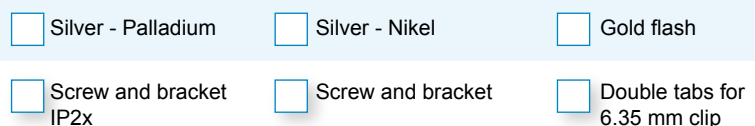


8- Complete the electrical diagram



Specify the type of contact
A - B - C le type de contact
1NO, 1NC, 1NO1NC,
Max.2 contacts per box

9- Check the type of contact



Toggle switches



22 Toggle switches - Complete units - Ø 22 Range

- Switch with cam followers - Black metal bezel - Attachment by punch screws - 1 or 2 contacts per tier, max. 8 contacts.
- Connection by tab for 6.35 mm clip

Description	Direction	Contact	Schematic	Part Number	Weight Kg
Toggle switch 2 directions with stable positions		1NC		L 2 2 T 1 O F 2	0.090
		1NO		L 2 2 T 1 F F 2	0.090
		1NO1NC		L22T1O1FF2	0.100
		2NC		L 2 2 T 2 O F 2	0.100
		2NO		L 2 2 T 2 F F 2	0.100
Toggle switch 2 directions with automatic return		1NC		L 2 2 T 1 O R A F 2	0.090
		1NO		L 2 2 T 1 F R A F 2	0.090
		1NO1NC		L22T1O1FRAF2	0.100
		2NC		L 2 2 T 2 O R A F 2	0.100
		2NO		L 2 2 T 2 F R A F 2	0.100

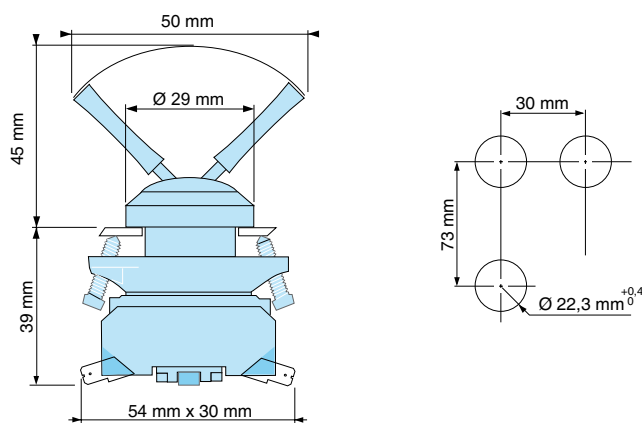
Connection by tab 6.35mm
add **F2** at the end of the P/N

Example: L22T2FRA **F2**

Dimensions - Cutouts

Support thickness : 1 to 6 mm

Add 16 mm to the 39 mm dimension
for every additional electrical tier



Interlocked pushbuttons



22 Heads for interlocked pushbuttons - Ø 22 Range

- Plastic button - Metal bezel - To fit on L22PR. electrical subassemblies

Description

Heads for interlocked pushbuttons.

Flush pushbutton

●	YSK2128A0	YSK2128A0N	0.025
●	YSK2128A5	YSK2128A5N	
●	YSK2128A2	YSK2128A2N	
●	YSK2128A4	YSK2128A4N	
●	YSK2128A6	YSK2128A6N	
○	YSK2128A9	YSK2128A9N	



Projecting pushbutton

●	YSK2129A0	YSK2129A0N	0.026
●	YSK2129A5	YSK2129A5N	
●	YSK2129A2	YSK2129A2N	
●	YSK2129A4	YSK2129A4N	
●	YSK2129A6	YSK2129A6N	
○	YSK2129A9	YSK2129A9N	

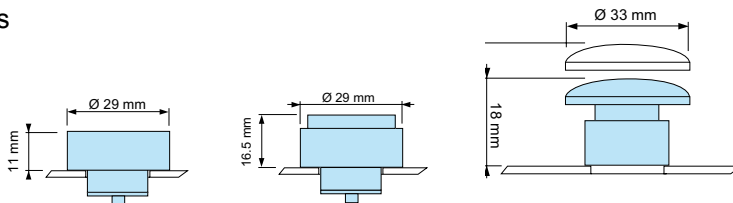


Mushroom pushbutton Ø 30 mm

●	YSK2130A0	YSK2130A0N	0.030
●	YSK2130A5	YSK2130A5N	
●	YSK2130A2	YSK2130A2N	
●	YSK2130A4	YSK2130A4N	
●	YSK2130A6	YSK2130A6N	
○	YSK2130A9	YSK2130A9N	



Dimensions



22 Electrical subassemblies for interlocked pushbuttons - Ø 22 Range

- Metal body - Attachment by punch screws - Connection by IP2x screw / bracket

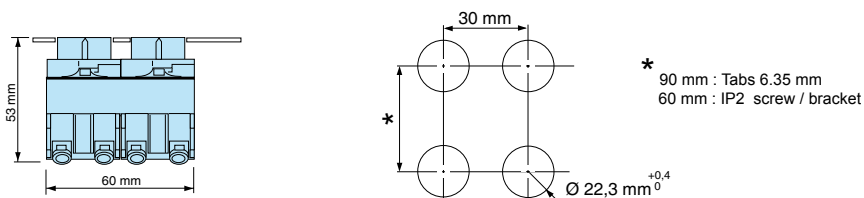
Description	Button	Contact	Schematic	Part Number	Weight Kg		
Electrical subassemblies for interlocked pushbuttons with stable positions	Button 1	1NO		L22PRRRRB V2TJ	0.025		
	Button 2	1NC					
	Button 1	1NO1NC				L22PRRRRC V2TJ	0.175
	Button 2	1NO1NC					
	Button 1	2NO				L22PRRRRE V2TJ	0.175
	Button 2	2NC					
Button 1	2NO2NC		L22PRRRRL V2TJ	0.220			
Button 2	2NO2NC						
Button 1	3NO		L22PRRRRI HV2TJ	0.210			
Button 2	3NC						

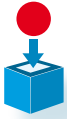


Connection by tabs for 6.35 mm clip
replace **V** by **F2**
Example: **L22PRRRRIH F2 T**J

Connection by screw & bracket IP2X
replace **V** by **V2**
Example: **L22PRRRRIH V2 T**J

Dimensions - Cutouts

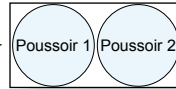




Interlocked pushbuttons

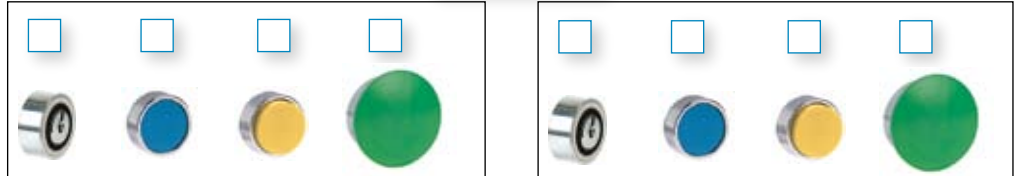


Definition chart



1- Check the type of head

(Key pushbutton:
Black colour, withdrawal at 3 o'clock)



2- Check the colour of the head

Black - Green - Red - Yellow - Blue - White

Black - Green - Red - Yellow - Blue - White

3- Check the type of contact

The contact type determines the number of electrical tiers.
See dimensions

1NO 1NC 1NO1NC 2NO 2NC 1NO2NC 2NO1NC

1NO 1NC 1NO1NC 2NO 2NC 1NO2NC 2NO1NC

3NO 3NC 1NO3NC 3NO1NC 2NO2NC 4O 4F

3NO 3NC 1NO3NC 3NO1NC 2NO2NC 4O 4F

4- Check the connection type

IP2x screw and bracket

Screw and bracket

Double tabs for 6.35 mm clip

Pedal switch



Pedal switch

- Rubber button - Plastic bezel - Attachment by four M5 screws

Description	Colour	Part Number	Weight Kg
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ON/OFF pedal switch Delivered with cable 4 m long + 4 self-tapping M5 screws	Black	YSN1133A0	0.150
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Other colours, contact us.



Breaking capacity	24V, 48V, 110V, 220V AC : 10A 24V DC : 10A 48V DC : 2A 110V DC : 0.4A 220V DC : 0.2A
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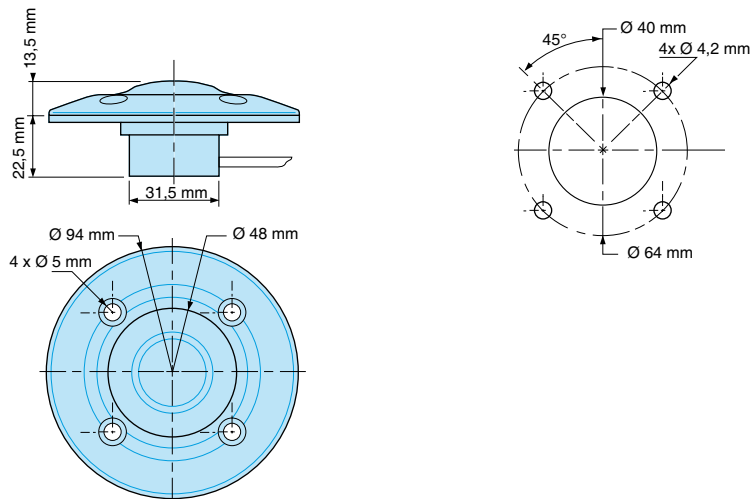
Mechanical shock	IK 10 as per NF EN 50 102
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Degree of protection	IP67 selon NF 605290 / IEC 529
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Operating temperature	-30°C to +50°C
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Cable	2 x 0.75 mm ²
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Dimensions - Cutouts



Compliance with standards







Certifications	IEC and NF 60947-5-1 and EN 50155
Vibration and shock resistance	IEC and NF EN 61373

Mechanical characteristics

Base	Ba9s
Height	28 mm
Operating temperature	-40°C / +85°C
Storage temperature	-40°C / +85°C

Electrical characteristics

Voltage	12V, 24V, 36V, 52V, 72V, 110V (+25%/-30%)
Consumption	~10mA
Overvoltage	1.4Unom/1s - 1.6Unom/100ms per EN 50121-2-3 and CEI 60061-1
Shock waves	1.8kV 1.2/50µs per EN 50121-2-3 and CEI 60061-1

Nominal voltage	Nominal current	Lighting threshold	Nominal luminous intensity +/- 25%	Ring color
12V	13mA	6.5V	1400mCd	
24V	13mA	14V	1200mCd	
36V	13mA	14V	1200mCd	
52V	9mA	28V	1000mCd	
72V	9mA	28V	800mCd	
110V	7mA	28V	600mCd	

Lighting characteristics

Color	warm white (2000°K to 4000°K)
High luminosity	from 600 to 1400 mCd depending voltage

Accessories



22 22 30 LED lamp






EMC reinforced - Protection against : overvoltage, transient voltage, shock waves - Control of electric ignition threshold - High luminosity - Non-polarized - Ba9S socket - High mechanical resistance (resining) - Indication of the voltage according to the color of the plastic ring.

Description	Color	Voltage(ring color)	Part Number	Weight Kg
LED BA9S	○	12V (blue)	YSP1352AD23R9C1	0.002
		24V (yellow)	YSP1352AD24R9C1	
		36V (violet)	YSP1352AD25R9C1	
		52V (black)	YSP1352AD20R9C1	
		72V (green)	YSP1352AD26R9C1	
		110V (red)	YSP1352AD27R9C1	

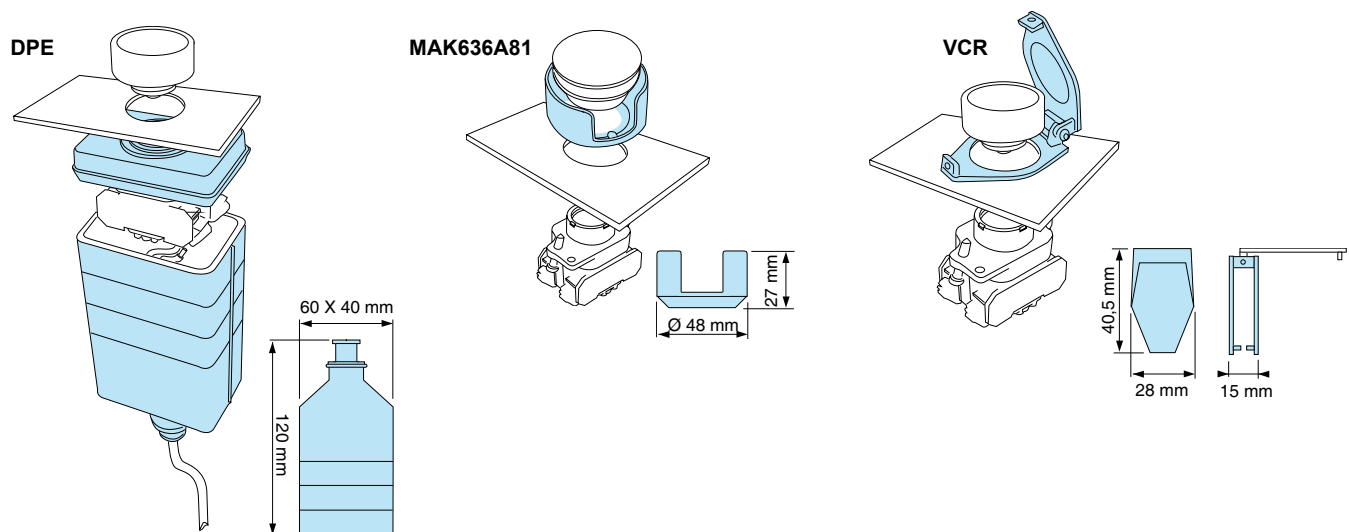


HF filter version
replace **A** by **B**
Example: YSP1352**B**I27R9C1




22 Sealing and protection

Description	Part Number	Weight Kg	
Flexible gasket for IP54	JE	0.001	
Gasket with metal insert for IP55 to IP67 or for thin front panels 1 to 4mm	TJ	0.006	
IP66 rubber sheat protecting against corrosive agents	DPE	0.070	
Plastic protective guard	MAK636A81	0.185	
Security flap for body L22 B and Ø 22mm head	● VCR ● VCV	0.004	

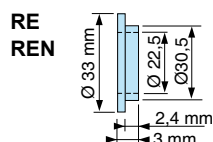
Installation and Dimensions



Miscellaneous

Description	Colour	Part Number	Weight Kg	
5-sided plastic key for TC5 head	Black Red	MAK196A0 MAK196A2	0.006	
Keys for pushbuttons and key selector switches	None	Clé 455	0.005	
30.5 / 22.5 adapter for 30.5 mm hole	Chrom-plated Black	RE REN	0.008	

Dimensions



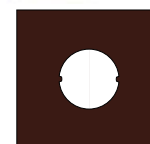
22 Plastic labels

Description	Markings	Colour	Part Number	Weight Kg
Labels (for engraving) 30 X 42 mm	Blank	Black / white background	PXK566A0	0.001
		Red / white background	PXK566A2	
		Green / white background	PXK566A5	
		Yellow / black background	PXK566A4	
Labels (for engraving) Ø 60 mm Labels (for engraving) Ø 90 mm	Blank	Yellow / black background	PXK567A4	0.006
		Yellow / black background	PXK568A4	0.009
Labels (for engraving) for switches 45 X 45 mm	Blank	Black / white background	PXK571A0	0.006
		Red / white background	PXK571A2	0.009
		Yellow / black background	PXK571A4	



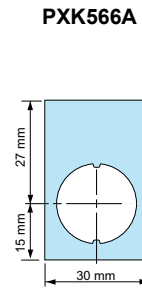
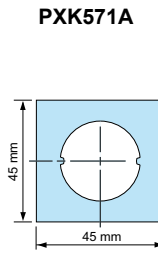
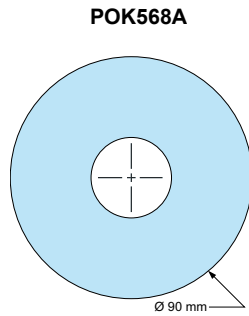
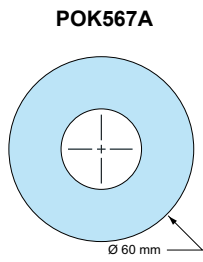
22 Aluminium labels

Description	Markings	Colour	Part Number	Weight Kg
30 X 50 mm label-holder for adhesive aluminium label	None	Black	MAK619A0	0.001
adhesive aluminium label 18 X 28 mm	Blank	Grey	PAK078A8	0.001
P20 aluminium label 30 X 41 mm	Blank	Grey	POK060A8	0.002
		Black	POK060A0	
		Red	POK060A2	
		Green	POK060A5	
		Yellow	POK060A4	
P20 aluminium label 30 X 41 mm Universal markings	O	Red background, white text	POK060A290	0.002
	I	Green background, white text	POK060A591	
	O - I	Black background, white text	POK060A092	
	I - II	Black background, white text	POK060A093	
	I - O - II	Black background, white text	POK060A094	
P21 aluminium label 45 X 45 mm	Blank	Grey	POK061A8	0.002
		Black	POK061A0	
		Red	POK061A2	
P22 aluminium label 60 X 45 mm	Blank	Grey	POK031A8	0.005
		Black	POK031A0	
P24 aluminium label 30 X 45 mm	Blank	Grey	POK062A8	0.003
		Black	POK062A0	
E1 aluminium label 65 X 65 mm	Blank	Grey	POK826A8	0.008
		Black	POK825A0	
P26 aluminium label 40 X 49 mm	Blank	Grey	POK030A8	0.003
		Black	POK030A0	
		Red	POK030A2	
P27 aluminium label 30 X 42 mm	Blank	Grey	POK049A8	0.003
		Black	POK049A0	
		Red	POK049A2	

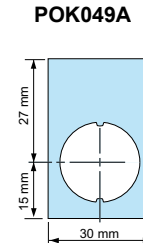
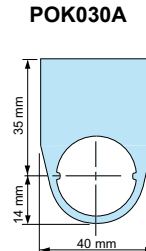
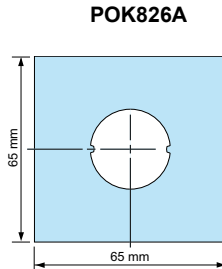
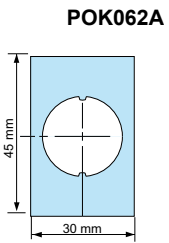
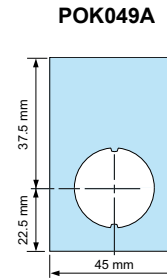
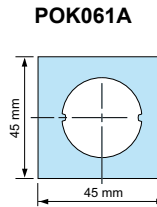
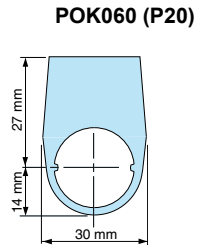
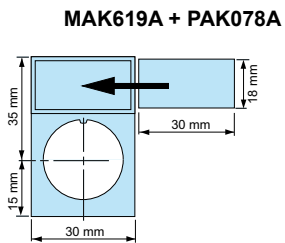


22 Plastics labels







Dimensions



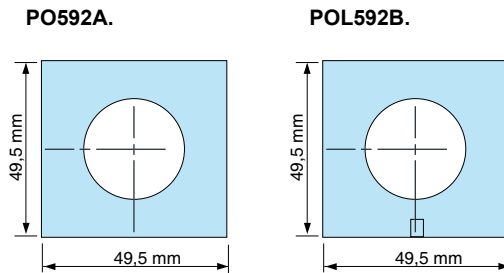
22 Aluminium labels



30 Aluminium labels

Description	Markings	Colour	Part Number	Weight Kg	
Labels (for engraving) 49.5 X 49.5 mm	Blank	Grey Black	POL592A8 POL592A0	0.002	
Labels (for engraving) 49.5 X 49.5 mm for components capable of being sealed	Blank	Grey Black	POL592B8 POL592B0	0.002	
Tightening ring and metal washer for non-illuminated pushbuttons and rotary switches			MAL924A1 + EDU750A1	0.010	
Tightening ring and metal washer for : - push-push pushbuttons - illuminated pushbuttons - illuminated push-push pushbuttons			MAL924B1 + EDU750A1	0.015	
Tightening ring and metal washer for key rotary switches			DYL421F	0.015	
Flexible gasket for sealing Ø 30 heads			JDK118A1	0.001	

Dimensions



Consult our other catalogues

Catalogue **A6-1**
Control components



Catalogue **B2-1**
Standard 16 A switches and Low level switches with self-cleaning contact



Catalogue **B3-2**
16A to 400A AC/DC Snap action switches



Catalogue **E1-4**
Standard and special Indicator lights



Catalogue **E7**
LED Marker / Tail lights



Catalogue **E8**
Display & Signalling



Catalogue **G1-2**
Low and medium voltage Insulators and Partitions bushings



Catalogue **F4-1** **Contact us**
BR500 junction terminals



Catalogue **F2-2**
Stud junction terminals



Catalogue **L1**
Watertight control boxes



Catalogue **D2-2**
Pendant control boxes



Catalogue **GB-L2-2**
ORCA Range



Catalogue **Dj -A1**
Disjoncteurs miniatures



Catalogue **MC -A1**
Microcontacts et fins de courses



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